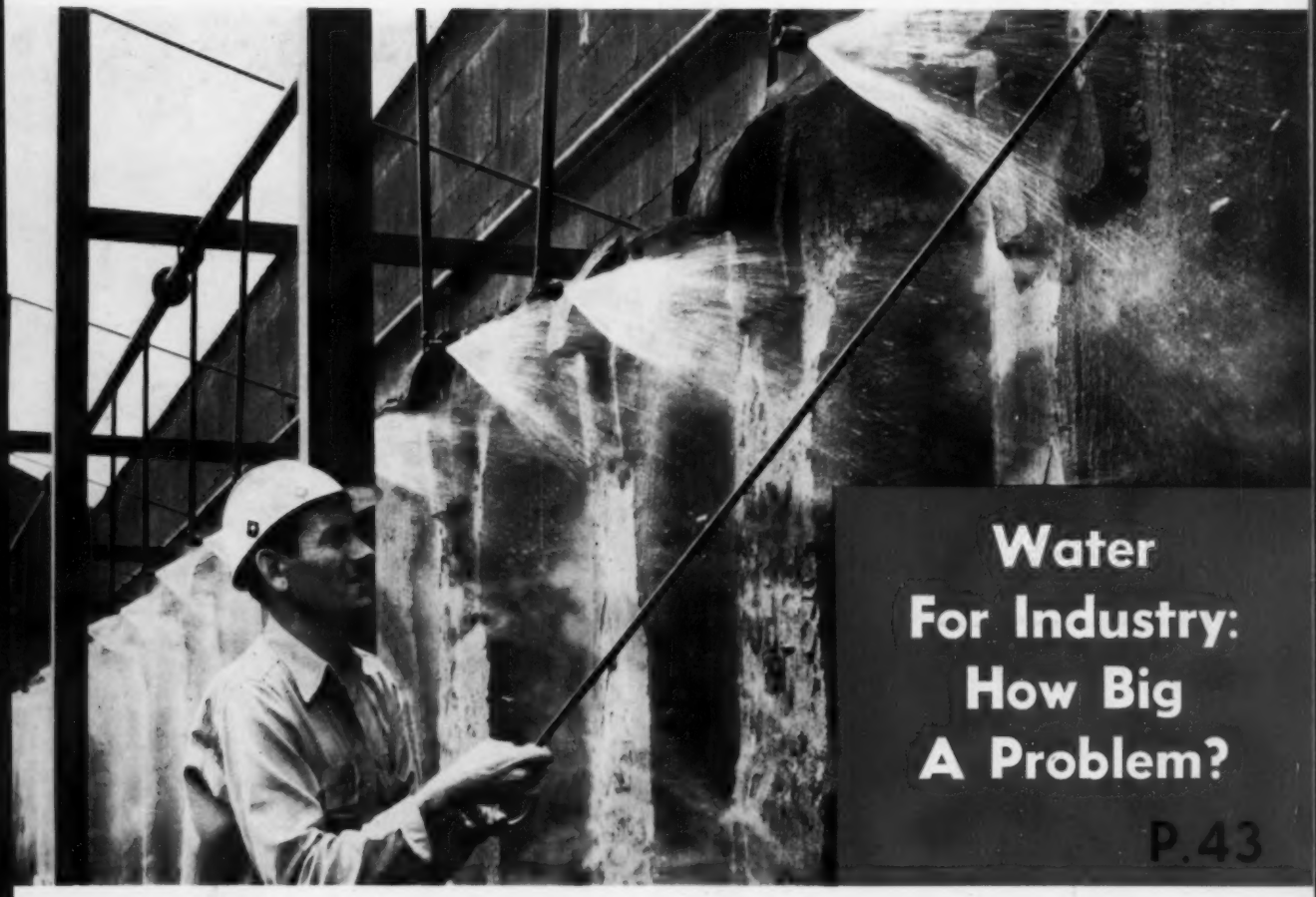
August 2, 1956

The IRON AGE

The National Metalworking Weekly



Water For Industry: How Big A Problem? P.43

Story Behind The Steel Strike Settlement P.46
Leaded Steels Break Production Records P.83
Digest of the Week P–2

HEY, YOU KRAUT-HEAD, GET YOUR ☆!!? STEAK OFF THAT HOOK --- I'M TRYIN' TO CHARGE NUMBER THREE!
THE DUTCHMAN'S SURE GONNA GET CLOBBERED THIS TIME. OLD MUSCLES IS SICK OF COMIN' DOWN HERE THE MIDDLE OF EVERY HEAT TO GET TH' CRANE OVER TO HIS FURNACE!
YEH, IF HE DON'T QUIT USIN' THE HOOK TO BROIL STEAKS HE'LL NEED ONE OF 'EM RAW FOR HIS EYE!
THANKS TO C. R. HEILIG
WIEKES

The Short Order

WHY NOT DESCRIBE YOUR OPEN-HEARTH CARTOON IDEA AND SEND IT ALONG TO US?

The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.

BASIC INCORPORATED 845 HANNA BUILDING • CLEVELAND 15, OHIO

Awesome press contains longest forgings ever made

Without seeing this incredible press at close range, it is difficult to grasp its true magnitude. Only a portion of the giant apparatus is shown in the photograph. Actually, it is as tall as an eleven- or twelve-story building, but the major part of it is underground. Considerably less than half of its height is visible above the working floor.

Designed and built by Loewy-Hydropress, Division of Baldwin-Lima-Hamilton Corp., this king of machines is rated at 50,000 tons. It is installed at the Wyman-Gordon-U. S. Air Force plant, North Grafton, Mass., where it is used in the making of large airplane components. It can, for example, forge an entire aluminum wing spar with a single mighty squeeze.

Speaking of forgings, the press itself actually contains some record-breakers. Its six columns consist of the eighteen longest forgings ever made. Eighteen identical steel sections, each with an overall length of 108 ft! All of these pieces were forged by Bethlehem in its Bethlehem, Pa., shops; so, too, were the crosshead supports, platen side rails, and certain other parts.

It is rare that a forge shop receives an assignment presenting such a challenge. It took months of painstaking effort to produce the column sections, but Bethlehem facilities were equal to the job. These same facilities are available to any customer who needs steel forgings. When we can be of service to you, please call or write.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

DIGEST OF THE WEEK IN METALWORKING

Aug. 2, 1956—Vol. 178, No. 5

The IRON AGE

Digest of the Week in Metalworking

Starred items are digested at right.

EDITORIAL

Who Won the Unwanted Strike? 7

NEWS OF INDUSTRY

*Special Report: Industry's Water Level Too Low? 43
*Labor: How Did Industry and Union Make Out? 46
*Marketing: Surprises Found in Stainless Survey. 48
*Production: Screw Industry Faces Tight Turns.. 49
*Financial: Red Investors in U. S. Business? 51
*Construction: Steel's Role in Road Program 52
Personnel: Iron Age Salutes 71
Iron Age Introduces 73
Metalworking Briefs 144

NEWS ANALYSIS

Newsfront 41
Report to Management 57
*Automotive Assembly Line 60
*This Week in Washington 65
*West Coast Report 67
Machine Tool High Spots 69

TECHNICAL ARTICLES

*Break Production Records With Leaded Steels.. 83
*Same Setup Tumble-Deburrs Large, Small Parts 86
*Drawn Parts Save Through Simplified Design.. 88
*New Sendzimir Mill Rolls Extra-Wide Sheet.... 92
Wheel Cakes Copper for Continuous Strip.... 94
*Metallurgical Library Pays Its Own Way..... 96
Technical Briefs 108
Materials Roundup 110

MARKETS & PRICES

*The Iron Age Summary—Steel Outlook..... 117
Steel Product Markets 118
Comparison of Prices 119
Iron and Steel Scrap Markets..... 120
Nonferrous Markets 124
Steel Prices 127

REGULAR DEPARTMENTS

Dates to Remember 13
Free Literature 100
New Equipment 114

INDEX TO ADVERTISERS 144

Copyright 1956, by Chilton Co.

THE IRON AGE, published every Thursday by CHILTON CO., Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the act of March 3, 1879. Price to the metalworking industries only or to people actively engaged therein, $5 for 1 year, $8 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $15; other Foreign Countries, $25 per year. Single copies, 50¢. Annual Review Issue, $2.00. Cables: "Ironage," N. Y.

Address mail to The IRON AGE
Chestnut and 56th Sts. Philadelphia 39, Pa.

NEWS DEVELOPMENTS

HOW DO UNION AND INDUSTRY FARE IN CONTRACT? P. 46

Steel labor probably got more than it expected, but pressure from two cabinet officers helped break the deadlock. Industry got its three-year contract, but the cost was high. Both sides learned lessons.

STEEL PAID PRICE BUT GOT WHAT IT WANTED P. 47

The strike cost steel producers a pretty penny. But producers got what they wanted in the form of a three-year contract at reasonable cost. Steel labor got good package too. Contract details.

SURPRISES IN STAINLESS MARKET SURVEY P. 48

Survey conducted by Warehouse Assn. and AISI shows variations in market for stainless. Aircraft takes more

than estimated, Chemical industry also a bigger user than generally believed. Survey may lead to other product studies.

SCREWS: TIGHTER TURNS AHEAD P. 49

The National Screw Machine Products Assn. removes the velvet from its crystal ball and gazes into the industry's future. What it sees will make some producers happy, others sad. But NSMPA tells all.

WATER SUPPLY is a growing concern to industry in many areas of the country. Although total supply is adequate, better utilization may be necessary. Special Report, p. 43, states problem, offers some solutions. (Pittsburgh Steel Co. photo.)

ARE REDS INVESTING IN U. S. INDUSTRY? P. 51

Since 1950, unknown foreign interests have been investing billions in U. S. securities. That their identity is being hidden by an ingenious method is causing the government no little concern. Financial undermining of defense industries is feared. At least two congressioal committees and the Securities Exchange Commission are investigating.

FEATURE ARTICLES

BREAK PRODUCTION RECORDS WITH LEADED STEELS P. 83

New and improved leaded steels are proving out claims for improved machineability right on the production line. Increased tap life, higher speeds and feeds, better surface finishes—all are built-in extras that go with machining the leaded product. Here's one shop's experience in mass producing a highly critical coupling with a leaded 4640.

SAME SETUP TUMBLE-DEBURRS LARGE, SMALL PARTS P. 86

Castings up to 30 in. long deburr in the same equipment used for handling 2 in. aluminum-clad parts. Not simultaneously, not with the same size abrasive—but at least in identical machines. Such diversity among workpieces forced one metalworker to go over to mixed-lot processing. Tests proved short-run production was no barrier to low-cost tumble deburring.

DRAWN PARTS SAVE THROUGH SIMPLIFIED DESIGN P. 88

Drawing shells and boxes offers numerous possibilities for cutting costs. But many are confined to the shops which develop them. Here are production-slanted tips aimed at overcoming some of the tougher drawing problems.

NEW SENDZIMIR MILL ROLLS EXTRA WIDE SHEET P. 92

A king-sized, 52-in. Sendzimir mill is now rolling stainless grades in widths up to 50 in. Combining high capacity with an ability to meet tough specifications, the new mill is holding thickness tolerances to ± 3 pct. Savings to fabricators tie in with wider stock, tighter tolerances.

METALLURGICAL LIBRARY PAYS ITS OWN WAY P. 96

Management doesn't always see eye-to-eye with research, engineering people on the need for a metallurgical library. It has to hard-headedly weigh cost against anticipated return. Here's a business-like approach to getting realistic cost data. Based on average needs of a 20-man-research-team company, it breaks down initial, operating costs, rates both against present expense.

MARKETS AND PRICES

ROAD PROGRAM'S STEEL NEEDS OUTLINED P. 52

Highway construction will mean a steel consumption of 49 million tons in next 13 years, Dept. of Commerce estimates. Their report includes a projected demand table for structurals and reinforcing steels.

EXPECT MAJOR CHANGES IN 1957 CARS P. 60

Anyone who wasn't particularly tempted by this year's auto styles won't have much trouble overcoming his own sales resistance in 1957. Automakers spent about $1 billion retooling for some big changes.

IS BRITAIN PUSHING RED TRADE TOO FAR? P. 65

U. S. officials are bothered by what is happening in Hong Kong. Volume of strategic material flowing to Red China through this port is increasing alarmingly. British trade policies considered the reason.

FARWEST SPURS METAL FURNITURE SALES P. 67

The trend toward outdoor living—outdoors in the patio, that is—may be attributed to Farwest influence. A large number of the nation's 100 summer furniture manufacturers are located there.

METALWORKING PAYS PIPER FOR STEEL STRIKE P. 117

It will be months before steel market overcomes effect of the strike. Scramble for position on steel order books began before strike ended, will be intense for balance of the year. Production loss heavy.

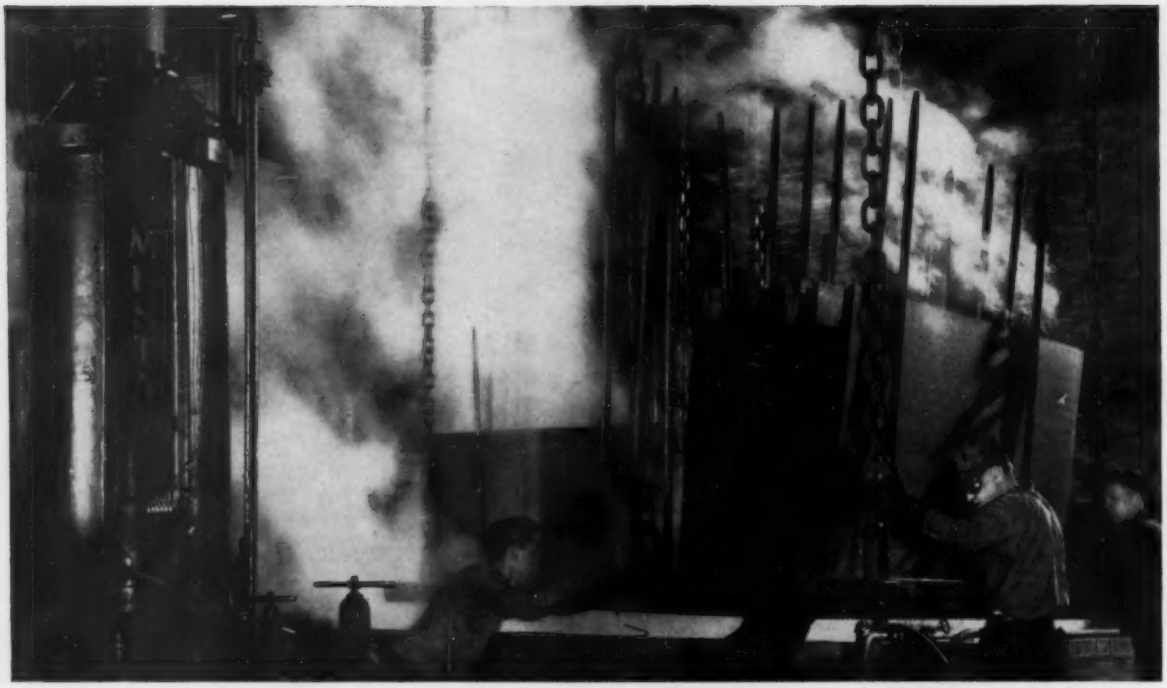
NEXT WEEK:

STRIKE CREATES PROBLEMS FOR METALWORKING

Strike losses of 11 million ingot tons hit metalworking with varying degrees of severity. Iron Age survey pushes aside guess work, gets at meat of how steel cosumers were affected, what they can expect.

RADIAL DRAW FORMING GIVES BETTER STRETCHES

This technique solves many problems in fabricating light weight, high strength parts out of expensive alloys at minimum cost. One-piece construction saves joining costs and avoids need for machining or hand fitting.



ACITROL

HOUGHTON PICKLING INHIBITOR COMBINES SUPERIOR BREAKDOWN RESISTANCE WITH STEEL-AND-ACID SAVING QUALITIES AND LOW PICKLING COSTS

Acitrol's breakdown resistance keeps its steel-protecting power at a peak even when pickling baths are used for long periods at prolonged high temperatures. Acitrol is an easy-to-use liquid that can be added directly to either concentrated acid or the pickling bath. Acitrol works equally well in commonly used pickling acids, provides full protection for high or low carbon or alloy steels.

Acitrol's wetting action speeds pickling, gets acid under scale in a hurry. Steel and acid saved cut costs per ton of steel processed. Pitting and smut formation are prevented. Acid fumes are kept to a minimum. Bright, clear finish after pickling provides good adhesion for organic or metallic coatings.

Your Houghton Man will be glad to tell you how Acitrol can help you pickle steel more efficiently, improve finish quality and appearance and reduce pickling costs. Call him today, or write E. F. Houghton & Co., 303 West Lehigh Avenue, Philadelphia 33, Pa.

ACITROL . . . a product of

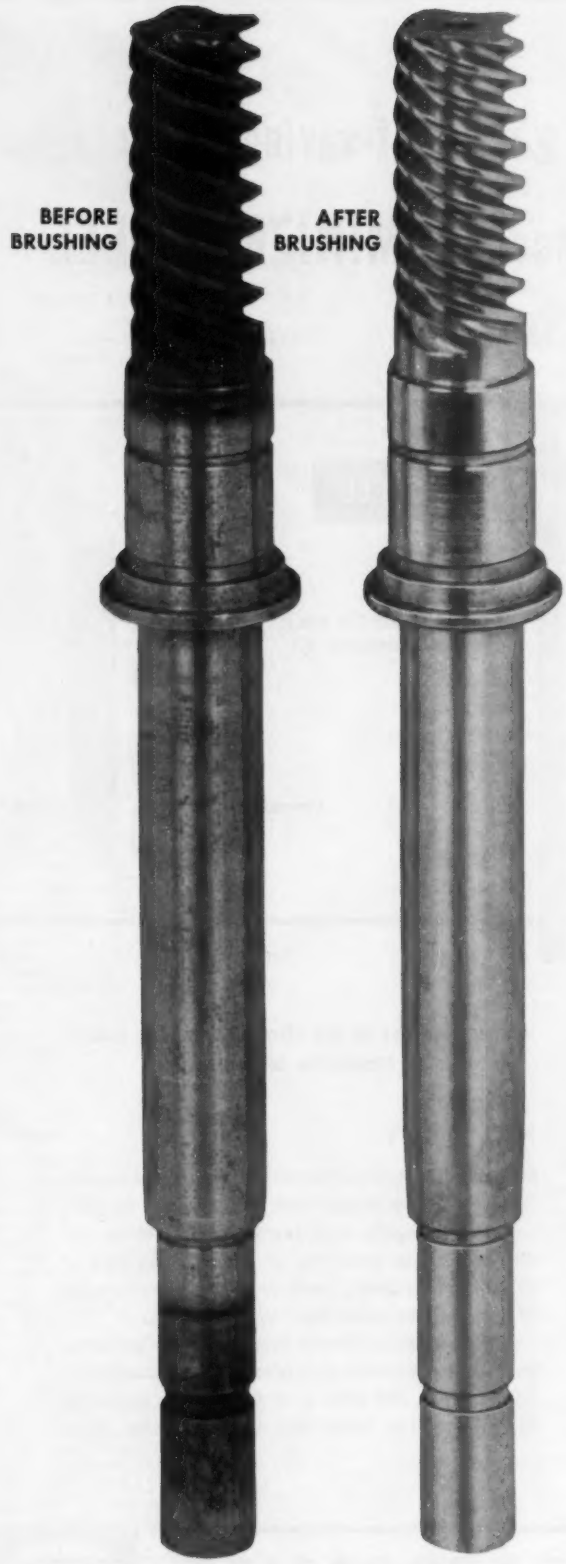
E. F. HOUGHTON & CO.

PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

HOUGHTON PRODUCTS FOR THE STEEL INDUSTRY

Hydraulic Fluids • Rust Preventives • Grinding Compounds • Cutting Oils and Bases • Special Purpose Lubricants • Heat Treating Materials • Leather and Synthetic Rubber Packings



7 finished for the price of 1

COMPLEX business machines have as many as 25,000 moving parts. Although most of these parts must meet exceptionally high quality standards, production economy is also an imperative consideration.

Take the armature shaft shown on the left, as typical. Osborn Brushamatic® methods improve the finish of the worm gear from an original 30 down to 4 micro-inches, at ⅓ the cost of the former method. *Seven parts finished for the price of one.*

An **O**sborn **B**rushing **A**nalysis, made at no obligation to you, will point out how *you* can use Brushamatic finishing to achieve similar results and savings. Write *The Osborn Manufacturing Company, Dept. F-48, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Major manufacturer of business machines uses six different Osborn Brushamatic® 3-A machines to finish parts in lot quantities of 300 to several thousand.

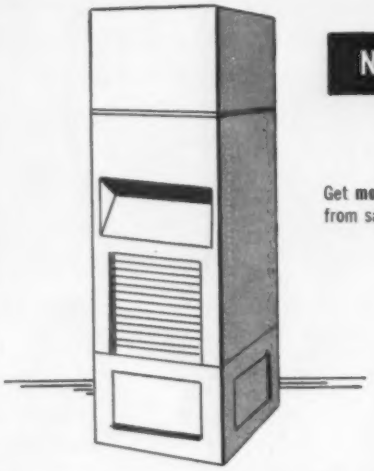
Osborn Brushes

OSBORN

BRUSHING METHODS • POWER, PAIN AND MAINTENANCE BRUSHES
BRUSHING MACHINES • FOUNDRY MOLDING MACHINES

under new A.G.A. approval requirements for gas-fired heating equipment . . .

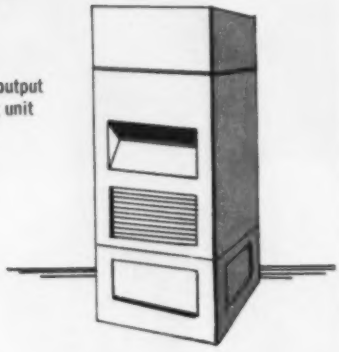
You can gain cost-saving advantages with Armco ALUMINIZED STEEL



Now with ALUMINIZED STEEL

Get **more** BTU output from same size unit

Get present BTU output from **space-saving** unit



New A.G.A. approval requirements permit use of hot-dip aluminum coated steel at operating temperatures up to 1030°F, plus room temperature, in heating elements of gas-fired heating equipment. This is an increase of 225°F over the old maximum.

These new approval requirements open the door to manufacturers who want to take full advantage of the heat- and corrosion-resisting properties of Armco ALUMINIZED STEEL Type 1. If you make gas-fired heating units, here's what this special aluminum coated steel offers you:

- **more BTU's from same size unit**
- **same BTU's from smaller unit**
- **space-saving units to meet modern trend**
- **lower cost than for any other heat-resisting material permitted at comparable temperatures**

HERE'S WHY:

Independent tests show that Armco ALUMINIZED STEEL stands up longer than any metal in its price class under cyclic high temperature heating and cooling in the presence of either sulfur-free or sulfur-bearing gases. Years of use by manufacturers of heating equipment back up these tests.

If you make appliances that require resistance to heat and corrosion consider Armco ALUMINIZED STEEL Type 1. Just write us at the address below for full information about this Armco Special Steel.

ARMCO STEEL CORPORATION

1876 CURTIS STREET, MIDDLETOWN, OHIO

SHEFFIELD STEEL DIVISION • ARMCO DRAINAGE & METAL PRODUCTS INC. • THE ARMCO INTERNATIONAL CORPORATION

The IRON AGE
FOUNDED 1855

Chestnut and 56th Sts.
Philadelphia 39, Pa.
SHerwood 8-2000

GEORGE T. HOOK, Publisher

EDITORIAL STAFF

TOM C. CAMPBELL, Editor-in-Chief
GEORGE F. SULLIVAN, Editor

Managing Editor — E. C. Beaudet
News-Markets Editor — J. B. Delaney
Technical Editor — J. J. Obrzut
Engineering Editor — W. G. Patton
Machinery Editor — E. J. Egan, Jr.
Metallurgical Editor — P. M. Unterweiser
Asst. News Mkts. Ed. — R. D. Raddant
Art Director — J. A. Degen

Associate Editors: J. G. Long, C. B. Moore, F. J. Starin. Assistant Editors: P. J. Cathey, R. Schulin, J. A. Moore; Regional Editors: K. W. Bennett, Chicago; T. M. Rohan, Cleveland; T. L. Carry, Detroit; G. G. Carr, New York; R. R. Kay, Los Angeles; G. J. McManus, Pittsburgh; G. H. Baker, R. M. Stroupe, N. R. Regelmbal, Washington. Correspondents: F. L. Allen, Birmingham; N. Levenson, Boston; R. M. Edmonds, St. Louis; J. Miller, San Francisco; R. Kazarian, Buffalo; D. A. Coughlin, Seattle; F. Sanderson, Toronto; F. H. Harley, London, England; Chilton Editorial Board: Paul Wooton, Washington representative.

WASHINGTON EDITORIAL OFFICE
Washington 4.....National Press Bldg.

BUSINESS STAFF

Production Manager — Warren Owens
Director of Research — Oliver Johnson
Circulation Mgr. — W. M. Coffey
Promotion Manager — Richard Gibson
Asst. Research Dir. — Wm. Laimbeer

REGIONAL BUSINESS MANAGERS

Chicago 2...T. H. Barry, W. R. Pankow
1 N. LaSalle St. — Franklin 2-0203
Cleveland 14.....Robert W. Watts
1016 Nat'l City Bk. Bldg. — Main 1-2263
Columbus 15, Ohio....Harry G. Mumm
LeVeque-Lincoln Tower — Capital 1-3764
Dallas 18.....G. A. Brauninger
8557 Eustis St. — Davis 7-4176
Detroit 2....Peirce Lewis, W. J. Mulder
103 Pallister Ave. — Trinity 1-3120
Los Angeles 28.....R. Raymond Kay
2420 Cheremoya Ave. — Holly'd 7-0741
New York 17....C. H. Ober, C. T. Post
100 E. 42nd St. — Oxford 7-3400
Philadelphia 39
B. L. Herman, J. A. Crites
56th & Chestnut Sts. — Sherwood 8-2000
Pittsburgh 22.....T. M. Fallon
1502 Park Bldg. — Atlantic 1-1832
W. Hartford 7.....Paul Backman
62 LaSalle Rd. — Adams 2-0486
England .....Harry Becker
National Provincial Bank Chambers, 15 Grafton St., Altrincham, Cheshire.

One of the Publications Owned and Published by Chilton Co. (Inc.), Chestnut & 56th Sts., Philadelphia 39, Pa.

OFFICERS AND DIRECTORS

Joseph S. Hildreth, Ch. of the Board
G. C. Buzby, President

Vice-Presidents: P. M. Fahrendorf, Harry V. Duffy; Treasurer, William H. Vallar; Secretary, John Blair Moffett; Directors: George T. Hook, Maurice E. Cox, Frank P. Tighe, L. V. Rowlands, Robert E. McKenna, Irving E. Hand, Everit B. Terhune, Jr., R. W. Case, Jr., John C. Hildreth, Jr.

Indexed in the Industrial Arts Index and the Engineering Index.

BPA NBP

EDITORIAL

Who Won the Unwanted Strike

◆ BEHIND THE PRESS PICTURE, the smiles, and the kind words is a hard cold fact. No one won the steel strike. Each side gained some important parts and parcels. The customer gained something even though it doesn't show through yet.

Let's not be coy about it; the government helped to settle the steel strike by background pressure. Fortunately, the final settlement came with the government out of the picture. That is well for future management-labor relations.

The industry won some well earned stability. Maybe now it can stay out of the national spotlight on wage and price matters for a few years. But it had to pay a price for this—a price higher than many of its leaders think was justified.

The Administration's drive to keep the economic ship of state from rocking too much means that industry will be expected to keep prices in check. That puts steel firms on the spot. The higher wage bill will have to be absorbed to a greater extent than many steel presidents believe should be done.

The union came off with a pretty good package but it did not win hands down. It had to agree to something that is a new twist for Dave McDonald's strong steelworkers' union. The trend is toward long contracts. That means more use of brains and less muscle-flexing.

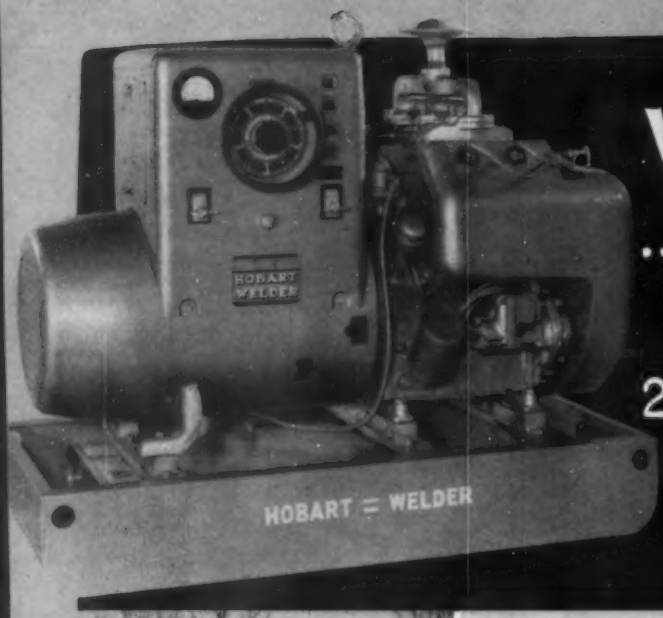
The customer has to pay a higher price now. He will have to pay more when the second and third year provisions of the contract become operative. This will force him to raise his prices but he won't want to price himself out of the market. So his job is much harder than that of steel management or the union.

The steel user may get steel easier after the six-months' "clean-up" of strike effects. He can hope too that the expansion program will eliminate the need to face continually stringent and short supply periods. He hopes more than anything else that the periodic inflationary wage and price periods are going to be fewer and farther apart.

One thing is certain: in the long run the public, the government and the customer are going to have more to say about basic industry and union agreements. You can bet on that.

Tom Campbell

EDITOR-IN-CHIEF



WELD!

...or operate tools, lights, motors with this popular light-weight, easy-to-use

2 in 1 combination ARC WELDER and POWER generator

HOBART WELDERS and ELECTRODES

SPEEDS WORK...AVOIDS DELAYS! SAVE HUNDREDS WITH THIS AC/AC ON THE JOB

Here's a valuable tool that lets you do welding right on the job—repair work that eliminates delays, teardowns and costly replacement parts—steel fabrication and erection, reinforcing, piping or special equipment installations—plus the extra advantage of being able to operate tools, lights, motors, etc., independent of outside power lines. Here's a new AC Welder/AC Power Unit that is easy to use, easy to move about, and ready on a moment's notice to go to work for you.

Lets your own men handle jobs much faster and easier just when you need your equipment most. Hobart's extra built-in features make this new AC/AC combination one of the most important pieces of equipment you can have on the job. It will pay you to get complete information, no obligation. Simply fill out and mail the coupon below to: **HOBART BROTHERS COMPANY, BOX IA-86, TROY, OHIO or phone 21223** • *one of the world's largest builders of electric arc welding equipment.*

There's a HOBART best suited for your particular work!

HOBART TROY OHIO WELDERS

Try HOBART'S **new and better** ELECTRODES

There's a size and type for every welding application. All Hobart electrodes are precision made, rigidly inspected and tested to assure uniform high quality. They are always the same—your guarantee of better, faster welds at lower cost. Ask for catalog on complete line.

HOBART BROTHERS COMPANY
BOX IA-86, TROY, OHIO

☐ Tell me about the AC Welder/AC Power combination in—
☐ Stationary ☐ Portable
☐ Also send information on_____capacity
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7

Name_____

Address_____

City_____ State_____

☐ *Mail catalog on complete line of electrodes.*

dear editor:

letters from readers

Battelle in Europe

Sir:

I read with considerable interest your July 5 story (p. 30) on Armour Research Foundation's planned informational operations on the Continent. However, your reference in the last paragraph to Battelle as a "U. S. observer on the European scene" leads me to realize that we owe you a fuller explanation of Battelle's role in Europe. Whereas Armour's function appears to be simply one of gathering European technological information for American firms, Battelle, as a matter of policy, does not maintain such an industrial information service as part of its European activities.

Battelle's laboratories at Frankfurt and Geneva are European entities, established to conduct research primarily for European firms, staffed by about 500 European nationals, and under the day-to-day management of European technical directors and research administrators.

Some of our Columbus research executives travel to the European laboratories, and probably always will. But these people are performing an internal coordinating function designed to continually upgrade the high research standards that are associated with the Battelle name. *R. O. Stith, Manager of Public Relations, Battelle Memorial Institute, Columbus, Ohio.*

Western Steel

Sir:

I read with considerable interest your prediction that steel users in eleven western states will consume 7.3 million tons of steel in 1956. This prediction appeared on page 193 of the January 5, 1956, issue of THE IRON AGE.

I would greatly appreciate your telling me your source of information if this is possible without violating any confidences. I am trying to determine both production and consumption of specific steel products in the far western states, especially California, Oregon and Washington. *L. J. Quinto, Lehman Brothers, New York, N. Y.*

You are quite right: our sources of information are confidential. However, I believe you will get the answer to your questions if you will check the West Coast Report, May 17, 1956, p. 77. Also see West Coast Report May 3, 1956, p. 77.—Ed.

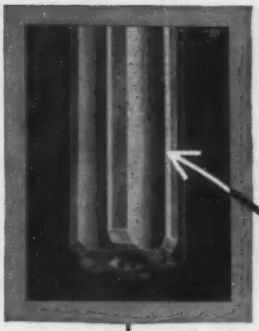
H-Iron

Sir:

We wish to thank the editors of THE IRON AGE for the excellent article on page 71 of the July 12, 1956, issue entitled "H-Iron: Competition For the Blast Furnace?"

We are, of course, more than pleased that you and your associates expressed your awareness of the potentialities of the H-iron process in such an interesting fashion. We think you should be congratulated for your grasp of the subject and the excellence of the presentation. *R. J. MacMullan, Ass't to the President, Hydrocarbon Research, Inc., New York.*

Chunks of H-Iron



This edge cuts reaming costs

L+I gives you the edge on production

Call your L+I distributor

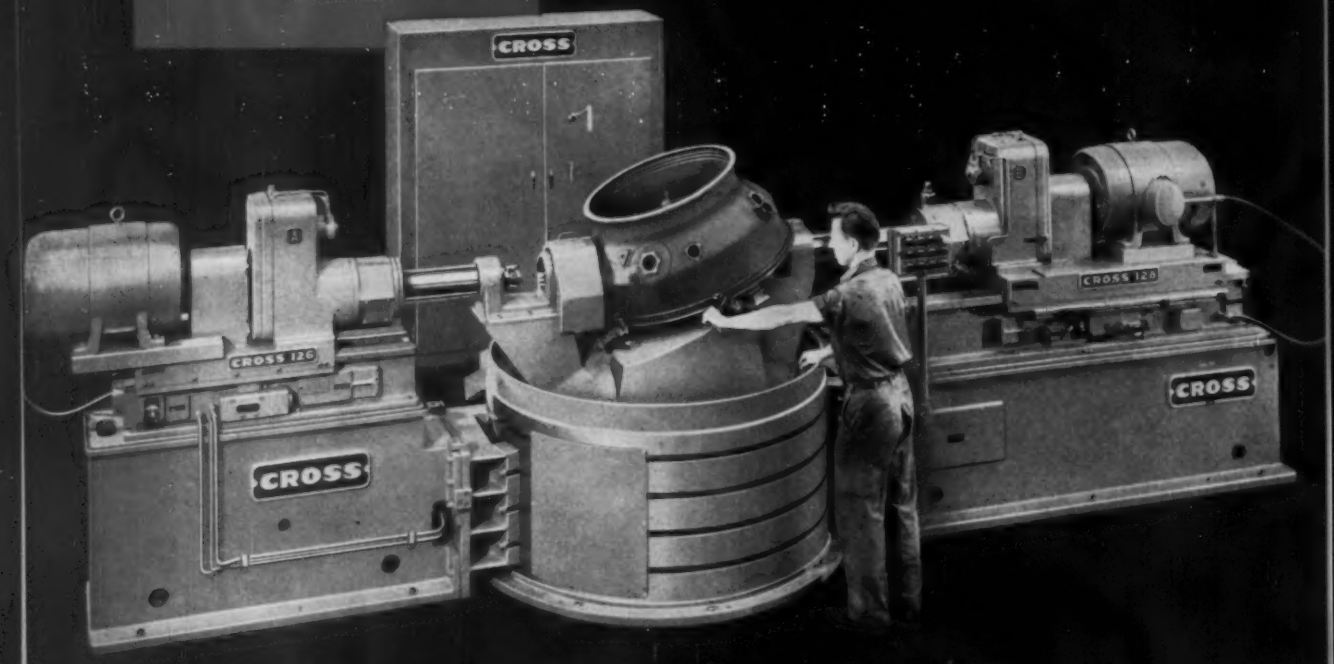
The Reamer Specialists

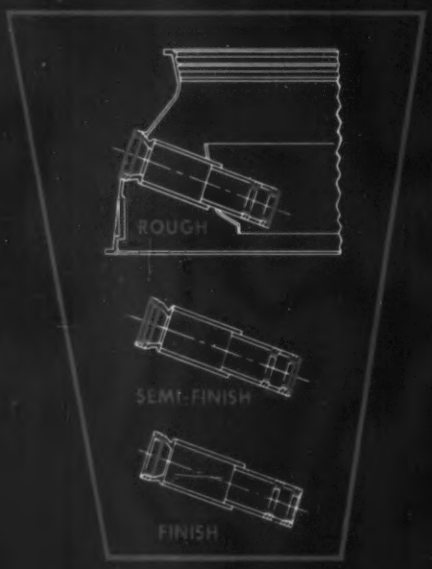
L&I

LAVALLEE & IDE, INC.
CHICOPEE, MASS.

Precision Bores and Faces Diffuser Cases

Another Special by Cross





This Two-Way Boring Machine roughs, semi-finishes and finishes the accessory drive shaft hole of Jet Engine Diffuser Cases at the rate of 2½ pieces per hour. The operator places the part in the work holding fixture and the rough boring cutters in the boring spindles, after which the rough boring is performed automatically. Next, the operator replaces the rough boring cutters with semi-finish boring cutters and the cycle is repeated for the semi-finish boring operation. Then, the finish boring operation is performed in a similar manner and the part is removed.

The cutters are supported in live precision bearing spindles, which are in turn supported by hardened and ground steel bushings adjacent to the work.

All cutters are pre-set for size and are quickly and easily changed for the different operations.

To provide maximum flexibility for future part design changes, the machine is built with Cross Modular "Building Block" Units.

Established 1898

THE CROSS CO.

First in Automation

DETROIT 7, MICHIGAN

fatigue cracks

by William M. Coffey

The Readers Don't Always Write (Us)

Like everyone else editors are nagged by the age-old question, "How'm I doin'?" One way to tell is by the number of letters we get from readers congratulating us on the articles they like and taking us to task for those they don't.

But it's not foolproof. You'll recall a short time back we told how businessmen are reluctant to write letters for fear of stepping on toes, riling customers, management, labor etc. And then there's the case where the readers bypass the editors and go right to the source for more information.

Case In Point

A beaut of a case in point is the feature article "New Powdered Material Reduces Bearing Wear" published last year in our August 11 issue. Submitted by Stanley Hodge, Manager, Tooling and Maintenance Dept., of the Security Engineering Co., in California, the article told of the company's happy experiences in using a new product called Iso-Mite.

After the article appeared the editors noticed a lively interest from the number of requests for reprints. But no more than we get on many of our articles. Then last week, Arthur Van Wyke of Iso-Mite Corp. kindly wrote us of the reader reaction on his company.

Here's part of the letter:

"There have been in excess of *five hundred letters*, directed to either Security Engineering or ourselves, telegrams, phone calls, and direct referrals from IRON AGE. The level from which they came has been most surprising—Presidents, Vice Presidents, General Managers, Superintendents, Chief Engineers, etc.—and with very limited exception, genuine validity was inherent. About 85 pct originated east of the Mississippi River and Canada; 10 pct east of the Rocky Mountains; and 5 pct from the West Coast and Foreign Countries. Approximately 65 pct of the responses were received within 60 days after publication, and the remainder to date."

Puzzlers

That fellow that couldn't get to the 10th floor by elevator was . . . a midget! (July 12 puzzler). And the prize-takers: Edward F. Moore, Ford Motor Co.; L. George Imperato, Blocked Iron Corp.; Ed Ellis, Nice Ball Bearing Co.; Charles Swartz; Bernard Solomon, Triangle Tool Co.; Charlsie, of course; Marion Forrister, Wyman-Gordon Co.; John M. Cluck, Lofkin Foundry & Machine Co.; Paul Tandler, Lewin-Mathes Co.; John Homer, Norm Chase, James Young and Henry Buresh, Collins Radio Co.; Glenn Canfield, Allis-Chalmers Mfg. Co.; Susan Welty, Gunite Foundries Corp.; Gerald Fisher, Wickwire Spencer Steel; Hill Sharp, Muncie Gear Works; A. Herman and C. Jeffords, Jr., The Falk Corp.; and E. L. Aul, Clark Bros.

"I didn't just drift into this way of life—I took a series of vocational aptitude tests."

IT PAYS to take a close look at the quality of the tubing you are using. Usually, it has as much to do with your machining and assembly costs as it does with the performance of your products. TMI tubing has proved its worth on the drawing board, on the assembly line . . . and on the profit reports of hundreds of America's fastest growing Companies.

WHEN YOU invest in the best precision workmanship, guaranteed by the dependable TMI "Mark of Quality," you follow in their footsteps. Don't take tubing quality for granted—take a closer look at your *real* tubing costs . . .

STAINLESS STEEL AND SPECIAL ALLOY TUBING

—in small diameters, .050" to .625" O.D. with tolerances as close as .001" when required.

"We are never too busy to help you solve your tubing problems the precision way."

TUBE METHODS INC.

METALLURGISTS • ENGINEERS • MANUFACTURERS

BRIDGEPORT (Montgomery County), PA.

Square locked head maintains ACCURATE alignment

Box section arm fully encloses driving shaft

100% Anti-friction bearings

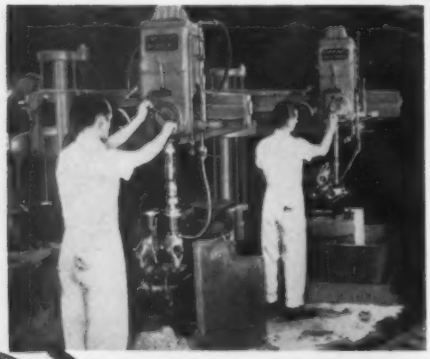
Head in perfect balance on arm

Arm swings with finger tip ease

No driving clutches

LONG LIVED ACCURACY

in this high speed Super Service Radial!



Drilling, Core Drilling and Reaming Alloy Steel Cheek and Counterweights of Aircraft Engine Crankshafts. Reamed holes are held accurate within .0005".

3 and 4 foot arm.

Spindle speeds up to 3500 r.p.m. without belts.

This simplified, very versatile, speedy, accurate and durable machine is rigid and easy to handle.

A distinctive feature is the elimination of spindle driving clutches as forward and reverse rotation is thru a reversing motor . . . very fast for tapping work.

Furnished with 9" column with 3' or 4' arm and 3 HP driving motor.

Get the details. In their range, these machines are most economical and productive.

Write for Bulletin R-21C.

CINCINNATI BICKFORD

RADIAL AND UPRIGHT DRILLING MACHINES

CINCINNATI BICKFORD DIVISION

GIDDINGS & LEWIS MACHINE TOOL COMPANY

OAKLEY, CINCINNATI 9, OHIO, U.S.A.

dates to remember

AUGUST

Society of Automotive Engineers, Inc.—National west coast meeting, Aug. 6-8, Mark Hopkins Hotel, San Francisco. Society headquarters, 29 W. 39th St., New York.

National Screw Machine Products Assn.—Annual national sales conference, Aug. 7-8, Wade Park Manor Hotel, Cleveland. Society headquarters, NSMPA Bldg., Cleveland.

Western Electronic Show and Convention—Aug. 21-24, Pan Pacific Auditorium and Ambassador Hotel, Information, WESCON, 344 N. LaBrea Ave., Los Angeles.

EXPOSITIONS

Assn. of Iron & Steel Engineers, Sept. 25-28, Cleveland.

Metal Show—Oct. 8-12, Cleveland.

SEPTEMBER

Metal Powder Assn.—Fall meeting, Sept. 7-9, Homestead, Hot Springs, Va. Society headquarters, 420 Lexington Ave., N. Y.

American Institute of Chemical Engineers—Fall meeting, Sept. 9-12, William Penn Hotel, Pittsburgh. Society headquarters, 120 E. 41st, N. Y.

Society of Automotive Engineers—National tractor meeting and production forum, Sept. 10-13, Hotel Schroeder, Milwaukee. Society headquarters, 29 W. 39th St., N. Y.

American Die Casting Institute—Annual meeting, Sept. 11-13, Edgewater Beach Hotel, Chicago. Society headquarters, 366 Madison Ave., N. Y.

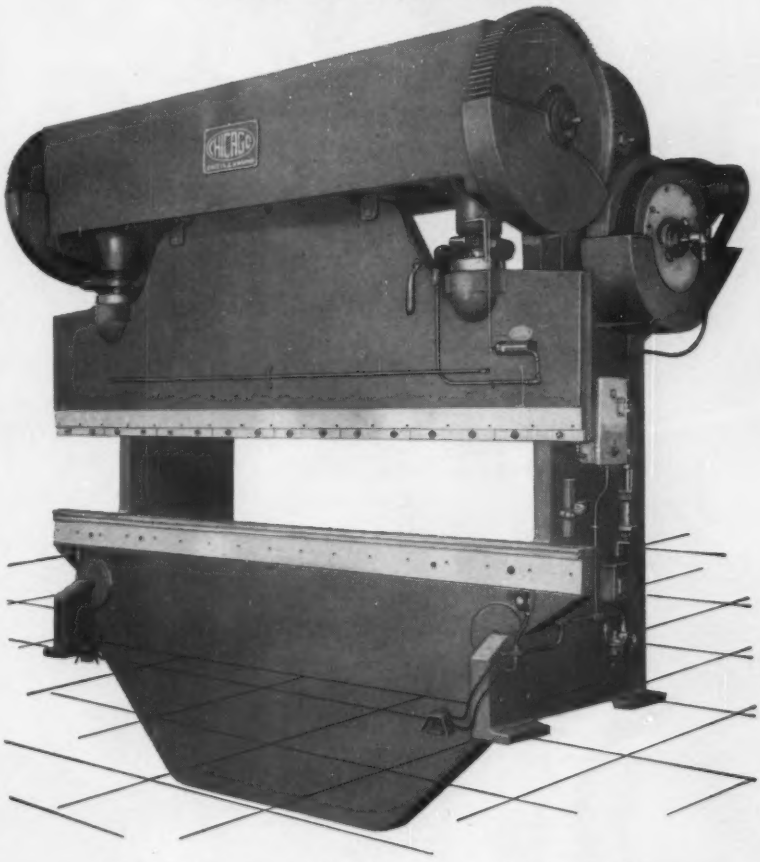
Porcelain Enamel Institute — Annual meeting, Sept. 12-14, Broadmoor Hotel, Colorado Springs, Colo. Society headquarters, 1145 19th St., N. W. Washington 6, D. C.

Instrument Society of America—Eleventh annual international instrument-automation conference and exhibit, Sept. 17-21, New York Coliseum, N. Y. Society headquarters, 1319 Allegheny Ave., Pittsburgh.

CHICAGO DREIS & KRUMP

Press Brakes

FOR BENDING • FORMING STEEL PLATES



The most modern design throughout with all the features for the fastest bending and forming of steel plates. Large variety of standard sizes and capacities. Also modified designs for special production work.

Complete Engineering Recommendations for Any Job on Request 6180

CHICAGO DREIS & KRUMP

Press Brakes • Straight-Side Presses • Press Brake Dies

Hand and Power Brakes • Special Metal-Forming Machines

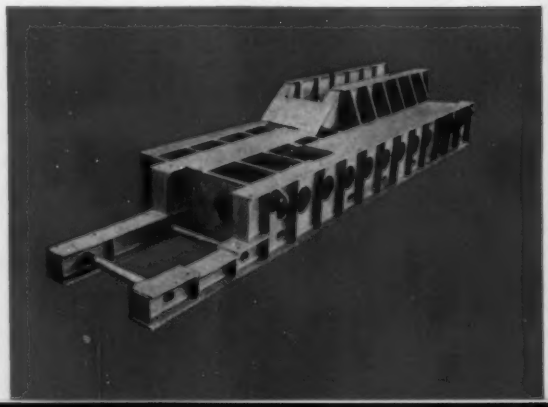
DREIS & KRUMP MANUFACTURING CO.

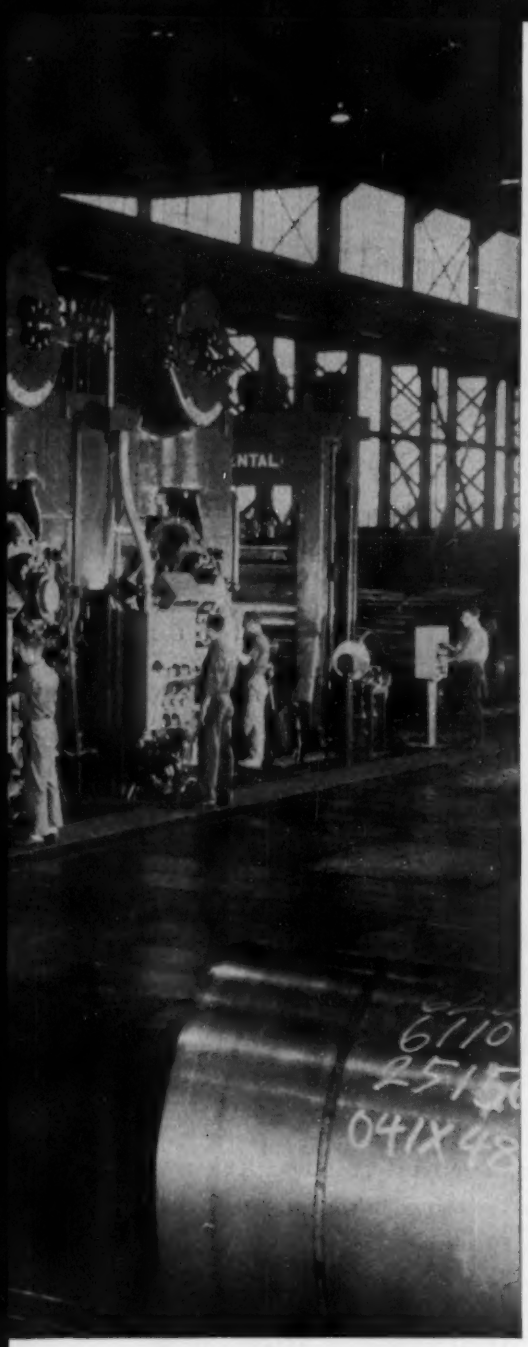
7430 South Loomis Boulevard, Chicago 36, Illinois

CONTINENTAL high-speed 21"x53"x60", 4-stand tandem cold mill in the Gibraltar Plant of the McLouth Steel Corporation.

CASTINGS—carbon and alloy steel castings from 20 to 250,000 pounds.

WELDMENTS—fabricated steel plate, or cast-weld design.





BLAW-KNOX

makes what it takes

to cold roll

at high speeds

In the Gibraltar Plant of McLouth Steel, this modern CONTINENTAL 60-inch, 4-stand tandem cold mill rolls steel at delivery speeds in excess of 3,000 fpm.

Designed to meet specific customer requirements, the mill has interesting features, such as—(1) entry and delivery coil conveyors of this cold strip mill, and two single-stand skin-pass mills, are at floor level—which provides greater safety, more efficient handling and easy inspection of all coils during processing. (2) mill equipment has built-in raceways to carry the electrical cables—which simplified the installation and provides easy access for maintenance.

BLAW-KNOX designs and builds *complete* rolling mill installations—assumes undivided responsibility from preliminary engineering to satisfactory operation. At any time we'll be glad to discuss your plans with you.

BLAW-KNOX COMPANY
Foundry and Mill Machinery Division
Blaw-Knox Building • 300 Sixth Avenue
Pittsburgh 22, Pennsylvania

Complete Rolling Mill Installations ... Including all auxiliary equipment ... for ferrous and non-ferrous metals

Hot strip mills • cold strip mills • slabbing mills • temper mills • universal mills • plate mills • blooming mills • structural mills • rail mills • billet mills • rod mills • merchant mills ... roll lathes • chippers • special machinery • and complete auxiliary equipment.

ROLLS—Iron, alloy iron and steel rolls for all types of rolling mills.

50th Anniversary
BLAW-KNOX
1906-1956

CONTINENTAL

since the time of man's first airplane flight . . .

HIGHEST QUALITY FOUNDRY COKE

The Wright brothers made the first successful airplane flight on December 17, 1903.

MILWAUKEE COKE SOLVAY

P M

MILWAUKEE SOLVAY is made from coal carefully selected for one purpose: to make the *best* foundry coke. Consistently high in carbon and low in sulphur and ash, highly resistant to shatter and abrasion, MILWAUKEE SOLVAY is carefully screened to the correct size for your cupola. In shipment after shipment, its unmatched quality remains the same.

Always in dependable supply, MILWAUKEE SOLVAY has remained the foundryman's choice for more than 50 years.

SERVICE DEPARTMENT AVAILABLE WITHOUT OBLIGATION

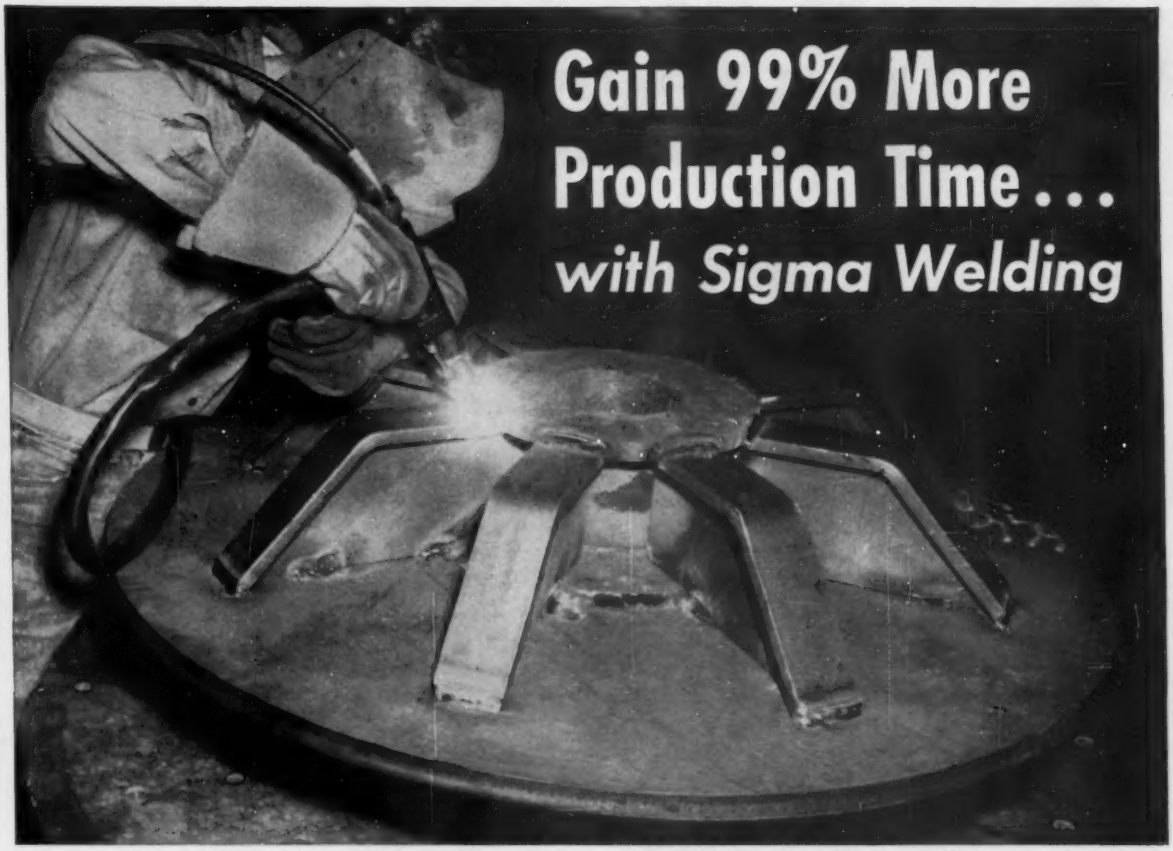
PICKANDS MATHER & CO.

CLEVELAND 14, OHIO

CHICAGO • CINCINNATI • DETROIT • DULUTH
ERIE • GREENSBORO • ST. LOUIS • WASHINGTON

Serving Industry Since 1883

IRON ORE • PIG IRON • COAL • COKE • FERROALLOYS



Steel gussets, 5/8-in. thick are sigma welded to 7/8-in. thick drum ends at an average speed of 15-in. per minute.

This welding operator doesn't have to bother with fluxes—and he doesn't lose valuable time changing burned down electrodes. In fact, by using sigma welding in this operation, the Cardwell Manufacturing Company, Wichita, Kansas has increased welding speed and almost doubled arc time. The results—a better product, faster, and at less cost.

AUTOMATIC WIRE FEED

Sigma welding uses a welding wire, supplied from a convenient sized coil, as a consumable electrode. In this case it is stainless steel wire which is fed automatically, and at a predetermined rate, into the welding arc. This ups welding speeds and simplifies work.

NO FLUX

The arc is maintained in a shield of argon gas which envelopes the area between welding wire and work piece. Inert gas protection assures highest weld quality, and further simplifies welding operations.

Sigma welding is available in both manual and mechanized setups. Call or write your local LINDE representative for free illustrated literature, and find out how you can gain new production speed and unit quality with a sigma welding installation.

Linde Air Products Company
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
Offices in Other Principal Cities
In Canada: LINDE AIR PRODUCTS COMPANY
Division of Union Carbide Canada Limited, Toronto

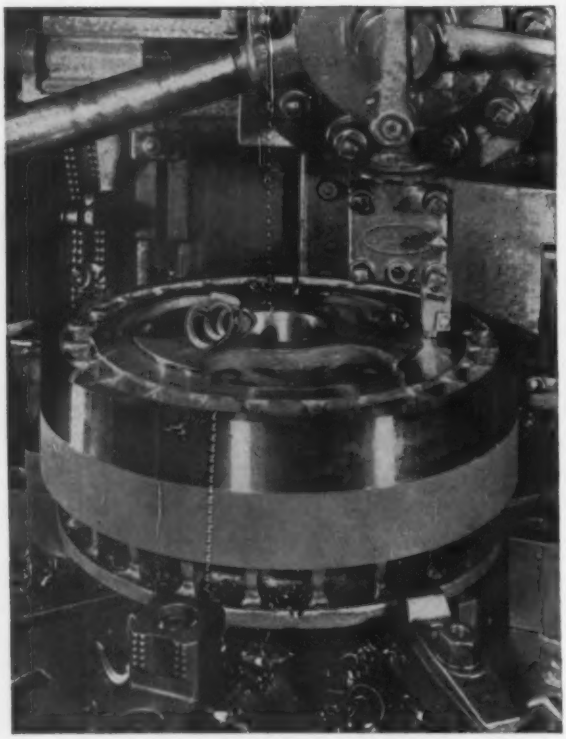
The term "Linde" is a registered trade-mark of Union Carbide and Carbon Corporation.

Linde
Trade-Mark

By using "Equivalent Grade" Charts when buying carbides...

YOU MAY LOSE THOUSANDS BY SAVING A FEW

Relying on "Equivalent Grade" Charts can lead to purchasing on low initial cost alone... whereas production ability really determines a tool's worth



TESTS ON 1045 CAST STEEL by a Chicago machine manufacturer demonstrate tremendous differences in carbides' production abilities. With Grade "X," as many as 16 clamp-on-type carbide inserts were required for a single facing cut on this power shovel clutch and brake drum.

A single Grade "Y" insert (Carboloy Grade 370) took nine cuts without showing any appreciable wear . . . under identical operating conditions. Result: over-all tooling cost reduced 90% on the 15-piece comparative run.

THE SO-CALLED "Equivalent Grade" Charts may be costing your plant literally thousands of dollars a year . . . in lost production, wasted manpower, higher machining expense.

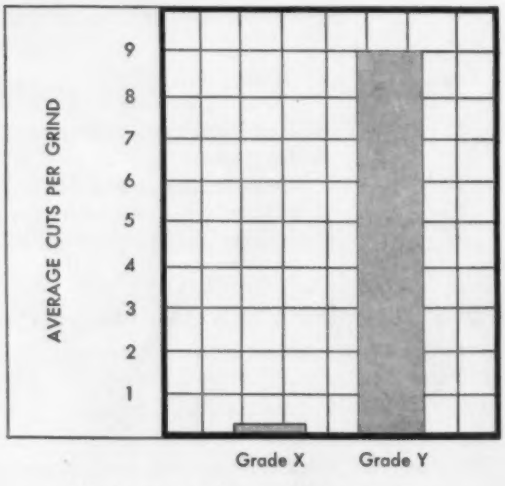
These charts conceal the tremendous differences in production abilities that always exist among various "equivalent" carbide grades. Worse, they tend to justify using initial cost, rather than over-all performance, as the basic criterion for purchasing carbide tools.

In-plant tests prove production abilities vary

What will happen to production if carbides are selected on the basis of the "Equivalent Grade" Charts? The case history at left gives the answer. It is typical of hundreds in the Carboloy files.

The average "Equivalent Grade" Chart lists no fewer than 14 different grades for this job . . . and implies that they can be used interchangeably. But in-plant comparative tests proved that no two grades could provide the same results.

When Grade "X" was selected, for example, an average of four inserts were required to take a single facing cut. But when Grade "Y" was used, a single carbide insert produced nine cuts . . . a tool life increase of 36 to 1 (Graph No. 1).



Graph No. 1—Production Ability Comparisons

OF PRODUCTION DOLLARS TOOLING PENNIES

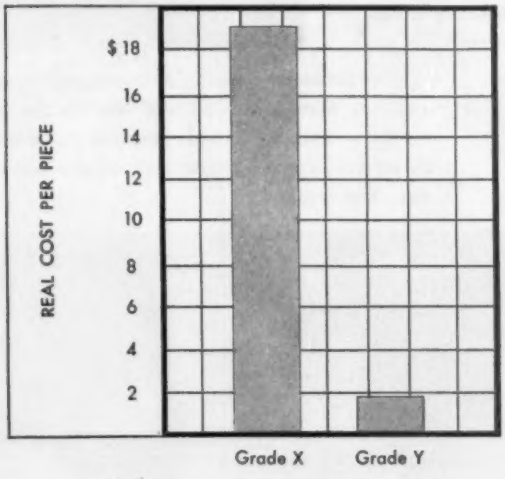
Why the tremendous difference? Grade "Y" simply had more production ability. It brought far more production per grind, reduced downtime, and drastically lowered grinding costs. Yet nothing in the "Equivalent Grade" Charts could predict this.

Initial Costs vs. Real Costs

Because "Equivalent Grade" Charts imply that all grades perform alike, they make it logical to assume that low initial cost is the most important consideration. A little arithmetic will prove that the *real* cost of carbides bears no relation to initial cost.

With Grade "X," total tooling cost for 15 pieces was $285.68 (16 tools at $13.04 each; 44 regrinds at $.41 each; 59 tool changes at $1.00 each). Machining cost per piece was $19.05.

Grade "Y" inserts cost $1.30 more initially. But total cost for 15 pieces was just $29.68 (2 tools at $14.34 each; 1 tool change at $1.00; nothing for regrinds). Real cost per piece with Grade "Y" was $1.98 . . . a reduction of 90%!



Graph No. 2—Real Cost Comparisons

Now add to these savings in tool cost, downtime, and grinding charges, the equally important savings from lower total manpower costs and reduced inventories. Then multiply the total by the number of jobs in the plant where similar cost reductions can be realized. You'll see why a few pennies more per tool is a small price to pay for carbides that can save you so much.

Cost-conscious purchasers specify Carboloy Extra-Performance Carbides

Grade "Y" in the preceding example is Carboloy Grade 370. It is one of three new, extra-performance steel-cutting carbides. These three grades – 330, 350, and 370 – cost slightly more initially because they are made by a unique and more costly process. But their performance is so superior to conventional carbides that there is no classification on the "Equivalent Grade" Charts to fit them.

Because of their extra production ability, these carbides easily show up the glaring shortcomings of the "Equivalent Grade" Charts. But even on conventional grades, actual tool comparisons prove the charts cannot be relied upon.

That's why we make this suggestion: Have comparative tests run in your own plant, on your own jobs. When the results are in, you too may find that your plant can save thousands of dollars a year simply by switching to carbides with greater production abilities.

With so much money at stake on every carbide tool used in your plant, you can easily see why the phrase "or equivalent" is rapidly becoming obsolete on tool specifications. These tests prove it really pays to specify *Carboloy* cemented carbides – by name.

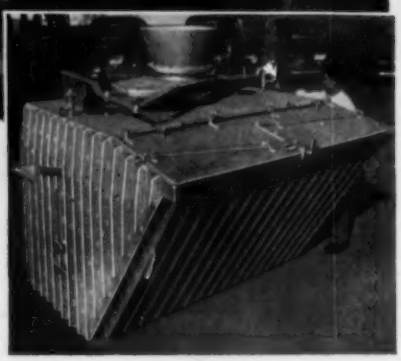
If you would like a more detailed discussion of the whole subject of Initial Costs vs. Real Costs, and the fallacies of the so-called "Equivalent Grade" Charts, write today for a Carbide Sales Engineer to call on you. *Metallurgical Products Department of General Electric Company, 11153 E. 8 Mile Street, Detroit 32, Michigan.*

"Carboloy" is a trademark of General Electric Company

CARBOLOY

CEMENTED CARBIDES

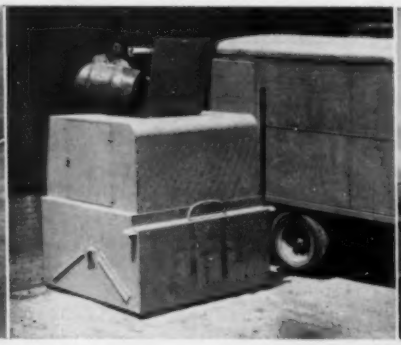
These save



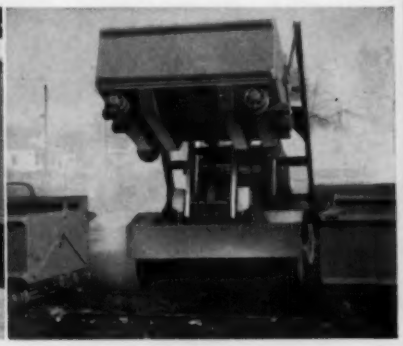
Dempster-Dumpster serving a 6 cu. yd. container with cooling fins for handling a high temperature product.

Here are a few of the hundreds of Detachable Containers we have built to solve handling problems of every description. A few others not shown include those with compartments . . . with insert containers . . . fully-insulated . . . lined with lead . . . lined with fire brick . . . with windows and doors . . . with casters . . . flat bottoms and open at one end . . . with teeth . . . with shelves for tools and supplies—and we could describe hundreds more, all served by one Dempster-Dumpster and only one man, the driver.

This 3 cu. yd. Container has skids for fork lift truck transfer.



10 cu. yd. Container widely used for refuse and combustible wastes.



Flanged wheel equipped containers for remote loading.

5176

DEMPSTER

4 manufacturers to $82,000.00 annually handling waste materials!

These four industrial plants expect to save, in labor costs alone, during the first five years service of the Dempster-Dumpster System—

A PLASTICS PLANT: $26,958.00 savings on an investment of $9,523.50 in Dempster-Dumpster equipment. Savings alone pay for equipment in two years.

A CHEMICAL PLANT: $204,076.75 savings on an investment of $40,968.00 in this equipment . . . savings pay for equipment in one year.

AN AUTOMOTIVE PLANT: $135,000.00 savings on an investment of $19,272.00 . . . savings pay for equipment in 9 months.

A PAPER AND PULP MILL: $43,104.00 savings on an investment of $10,750.00 . . . savings pay for equipment in 1¼ years.

Those are typical examples. Visualize a Dempster-Dumpster, operated by only one man, the driver, serving scores of big steel containers, one after another, in your plant. Containers of many designs and types, handling waste or salvable materials, raw or finished products, fluids including acids, combustibles, dusty materials—anything that can be handled in up to 21 cu. yd. detachable Dempster-Dumpster Containers . . . payloads up to 19 tons. Savings are tremendous! Take advantage of our free engineering service, which determines by fact-finding survey the cost cutting possibilities of this system in your plant. Dempster Brothers, Inc.

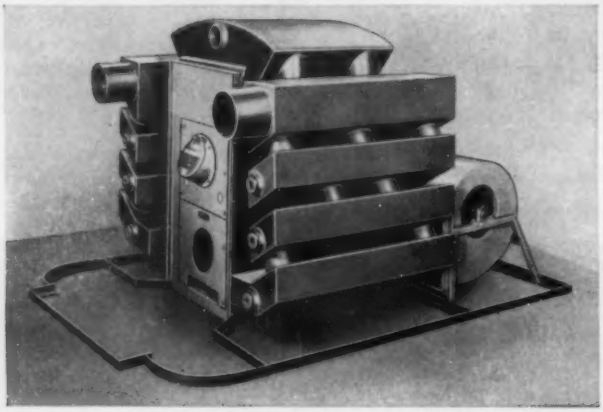
600 Gal. stainclad tank with brine cooling channels.

A Container available up to 10 cu. yds. with or without lids for many uses.

A 9 cu. yd. container for handling packaged products.

BROTHERS 486 N. Knox, Knoxville 17, Tennessee

Alloy steel cap screws



SAFE, GAS-TIGHT JOINTS required by the down-flow construction of this year-round furnace and air-conditioning unit are easy to obtain, using Republic ELECTRUNITE® Mechanical Tubing. Its uniform roundness, wall thickness, strength and ductility help simplify design and fabrication. Quality control from raw ore to finished product assures long, trouble-free service.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

assure hermetic seal permanence

One of the most critical points in maintaining an absolute hermetic seal in any refrigeration system is the joint between compressor cylinder and head. That's why Copeland Refrigeration Corporation of Sidney, Ohio, manufacturer of fine commercial refrigeration and air conditioning compressors, insists on cylinder head cap screws made to exacting specifications. Republic Alloy Steel Hex Head Cap Screws fill the bill perfectly. They more than meet tensile strength, yield point, hardness and ductility requirements.

Design of the Copeland Compressor calls for cap screws to clamp cylinder head, a neoprene gasket, valve plate, another neoprene gasket and cylinder block into one solid, leakproof assembly. Year-in, year-out service dependability demands that these fasteners neither stretch nor lose their grip under the heating and cooling cycle of on-off operation. There must be no loss in compression or escape of refrigerant. Again, Republic Alloy Cap Screws are more than equal to the task—as proved by their failure-free performance record.

Whatever your fastener problem, it will pay you to check Republic. 20,000 standard and 8,000 special types and sizes of headed and threaded products are available to satisfy a tremendous variety of applications. Each is backed by a century of experience, and quality controlled from raw ore to finished product.

You can get complete information through your local Republic office. Or simply mail the coupon.

OUTSTANDING PRODUCT PERFORMANCE is assured when you specify Republic Hot Rolled Carbon or Alloy Bars as your raw material. A full range of standard and special shapes, sizes and grades is available to meet the most exacting requirements. Further, Republic's 3-Dimension Metallurgical Service can help you select the proper type, and process it efficiently.

ZINC COATING PERMANENCE makes Republic Continuous Galvanized Sheet ideal for hundreds of mass-produced parts and products. Its uniform, corrosion-resistant zinc coating will not crack, flake or peel under any forming operations permitted by the base metal. Resulting product is far less expensive to produce than old-fashioned, hot-dipping after fabrication would allow. Send coupon for information.

STEEL

and Steel Products

REPUBLIC STEEL CORPORATION
Dept. C-2405
3104 East 45th Street
Cleveland 27, Ohio

Please send me further information on:

☐ Fastener Products ☐ Continuous Galvanized Sheets
☐ ELECTRUNITE Mechanical Tubing ☐ Hot Rolled Bars

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

ERIE PRESS OF THE MONTH

HYDRAULIC FORGING PRESS

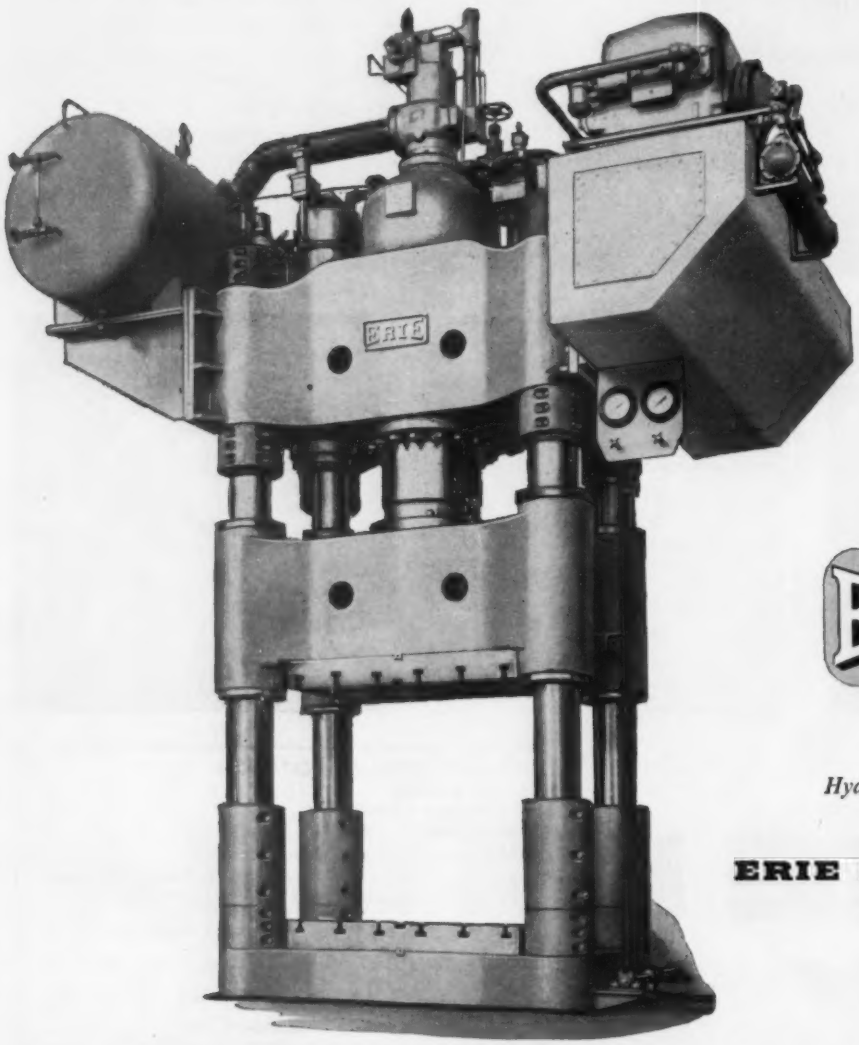
CASE HISTORY #4 A long-time Erie Foundry customer asked us to build a hydraulic forging press for flat die steel forging and planishing. The press had to be rugged, but fast acting.

Erie Foundry Hydraulic Engineers conferred with their colleagues who design and build Erie forging hammers. These conferences determined the most exacting requirements to which a hydraulic press could be subjected and from this knowledge emerged this 750-ton forging press.

When the press is used for planishing operations, a selector switch on the instrument panel turns the full oil volume from the main ram to two auxiliary cylinders which are then operated by the same hand controls. A special high-speed filling valve in the prefill system used in conjunction with a pressurized large capacity prefill tank—allows the press to operate at the very fast speed of 60 planishing strokes per minute.

The main, or forging ram—23-inch diameter—operates at a full capacity with a 36-inch maximum stroke. The press is operated by two hand levers, one controls the displacement of the pump, and the other controls the moving platen.

Erie Foundry Hydraulic Press Engineers are continually designing and building special purpose hydraulic presses. Call them when you feel that the proper hydraulic press will expedite your production.



ERIE

SINCE 1895

Hydraulic Press Division

ERIE FOUNDRY CO.

ERIE, PA.

Which package is best for you?

ROEBLING HIGH CARBON WIRE is packaged in many ways... and for every kind of usage there's one particular type of packaging that will bring top handling and production efficiency... new economy in your plant. For certain wires, Roebling's new large-size reels or new disposable spoolless cores have special money-saving advantages:

The large reels are ideal for long runs. They reduce down time to a minimum.

The new spoolless core (a hollow fibre core without flanges) abolishes the storing and return of empty spools ... eliminates charges for spools and waiting for credits.

You *pay* for the best when you buy high carbon wire. Make sure you *get* it in wire and packaging. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING CF&I

Subsidiary of The Colorado Fuel and Iron Corporation

ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. & 5 PITTSBURGH ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 2340 GLENDALE-MILFORD RD., EVENDALE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • ROCHESTER, 1 FLINT ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • ST. LOUIS, 3001 DELMAR BLVD. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK

Above left, threading inside of Johnson bar on screw machine.

Above right, general view of Bridgeport Machines Co. final assembly line. Right, Johnson Bronze part is inserted in bracket.

Bridgeport Machines Company Relies on Availability and Durability of Johnson Bronze Bars

Although it was founded less than thirty years ago, Bridgeport Machines Company is one of the nation's leading manufacturers of milling machines.

Contributing to the smooth flow of production is the prompt delivery of the Johnson Bronze bars necessary for two vital parts. "Although we use several thousand bars each year, we are able to work from a small inventory," says Mr. Victor Carlson, Purchasing Agent for Bridgeport Machines. "This is possible because of quick, efficient delivery and servicing through the local Johnson distributor."

Terming them a good, reliable item, Mr. Carlson reports that despite all sorts of conditions of use and maintenance, Bridgeport Machines has never had a complaint on the durability of the Johnson Bronze parts in their milling machines.

Even though they have needed it only once in the six years they have been using Johnson bars, Bridgeport Machines was pleased to have the field engineering service of Johnson Bronze Company available. When trouble developed on the production line a few months ago, a Johnson engineer was secured through the local distributor, and the problem was worked out in two days' time.

If you are having delivery or quality problems with your present bronze bar stock, consult your local Johnson distributor. From his list of over 400 stock sizes of cored, solid and hexagon bars, it will be easy to get the exact high-quality bars needed in your operation—without delay.

For a free catalog of Johnson products, ask your distributor or write Johnson Bronze Company, 505 S. Mill Street, New Castle, Pa.

Johnson Bearings

GRAPHITED
over 175 sizes

GENERAL PURPOSE
over 900 sizes

UNIVERSAL BRONZE BARS
over 400 sizes

LEDALOYL
over 400 sizes

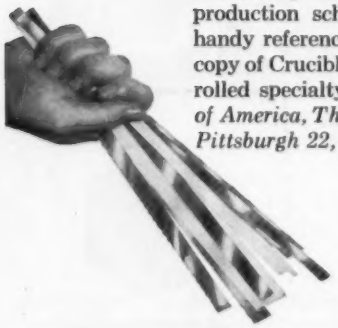
ELECTRIC MOTOR
over 350 sizes

for dependable deliveries of cold rolled specialty steels —call CRUCIBLE

Crucible is geared to give you *reliable, on-time deliveries* of a wide variety of cold rolled specialty steels—carbon spring, alloy strip . . . coils or cut lengths . . . in the size, finish and temper you specify.

And you're sure of *quality* from Crucible—*fine finish . . . better edges . . . improved flatness.*

So, for prompt deliveries, timed to meet your production schedules—call Crucible. And, for handy reference—mail the coupon for your free copy of Crucible's 32-page fact-filled book on cold rolled specialty steels. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*



Crucible Steel Company of America
The Oliver Building, Mellon Square, Pittsburgh 22, Pa.

I'd like a copy of your 32-page booklet on cold rolled specialty steels.

Name_____ Title_____

Company_____

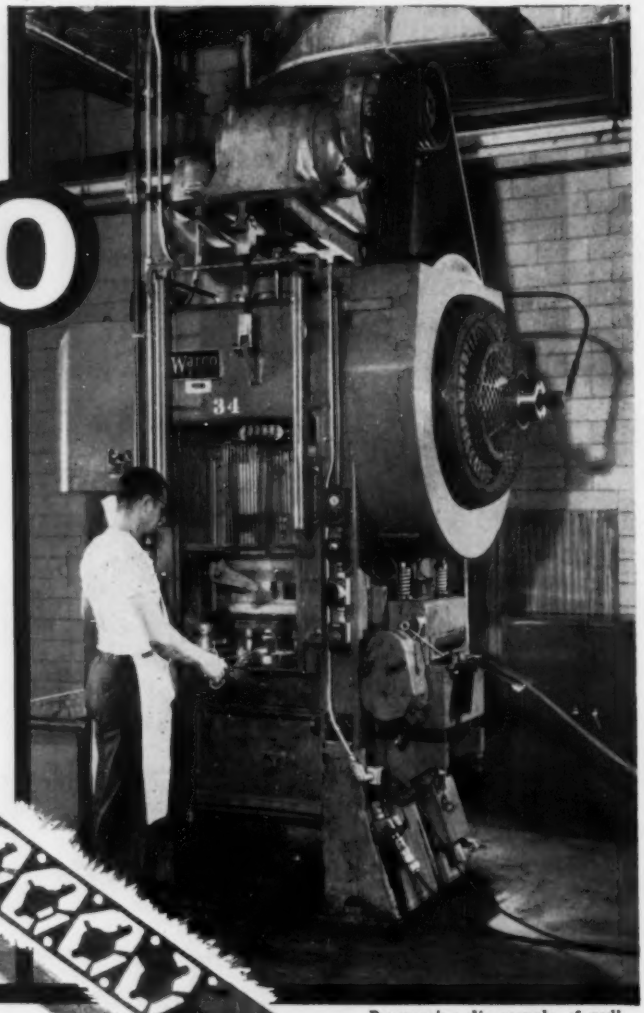
Address_____

City_____ Zone_____ State_____

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

How Warco® PRESSES help Kodak make precision cameras



Progressive die sample of pull-down claws for Kodak's Cine-Kodak Medallion 8 Camera. Warco Press produces about 6,000 per hour.

For the past eight years, Eastman Kodak Company has been using Warco Presses to stamp out many of the components used in their popular camera line. From time to time, as production demanded, Kodak has added to its Warco equipment and has found it met specifications right down the line. The 75-ton High Speed press, above, is typical of the Warco equipment. Feeding directly from coil stock through progressive dies they blank, perforate, form and emboss. The press operates at speeds up to 100 strokes per minute, turning out as many as 6,000 completed pieces every hour.

You'll find more and more Warco Presses operating in plants, like Eastman Kodak where quality and long, trouble-free service are appreciated. *The Federal Machine and Welder Co., Warren, Ohio.*

Cine-Kodak Medallion 8

Brownie Holiday Flash

Brownie Hawkeye

9872

Federal WELDERS®

Warco PRESSES®

The Federal Machine and Welder Company

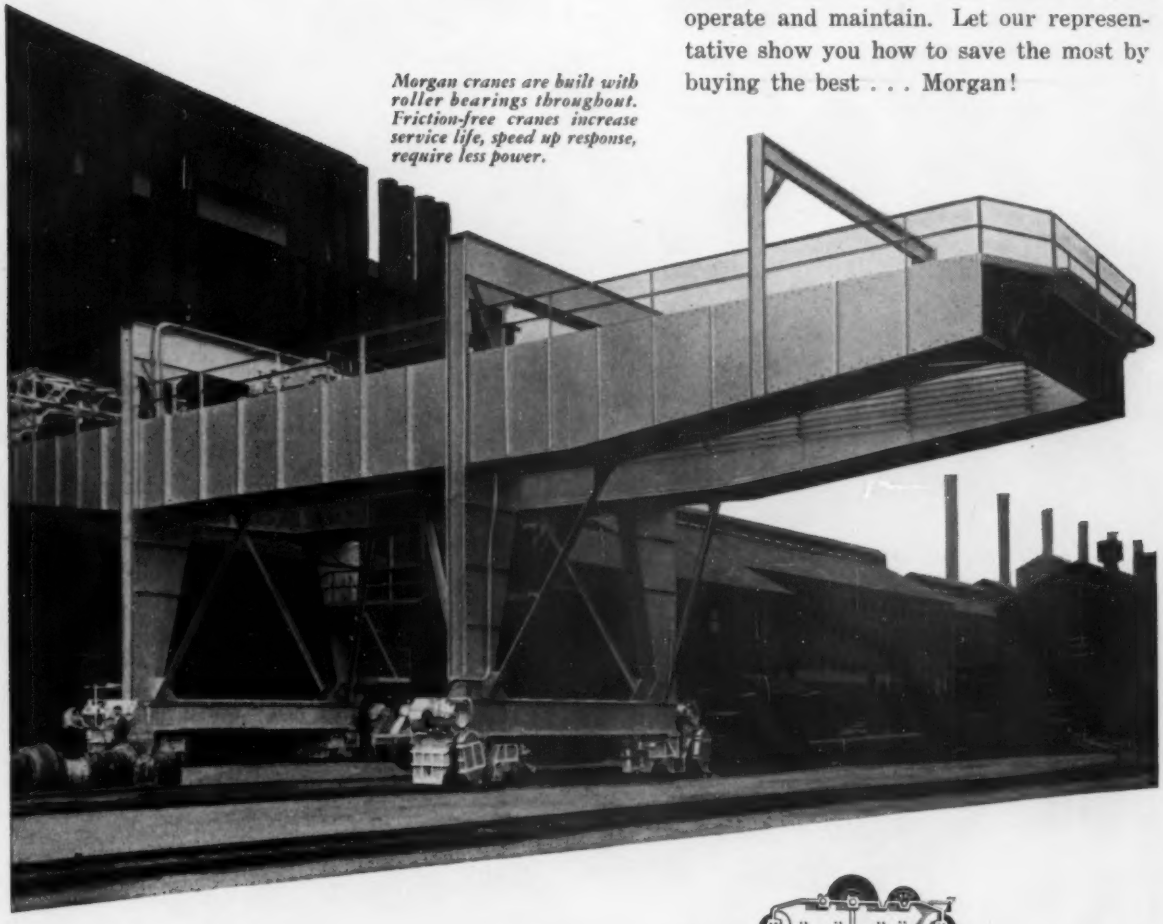
WARREN, OHIO

How Morgan keeps cranes "rolling"

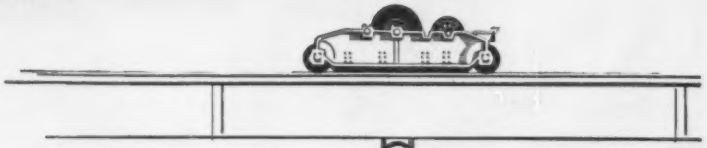
• MORGAN "Anti-Friction Engineering" keeps cranes rolling by providing precisely correct bearings and mountings for each specific application . . . your assurance of longer trouble-free operation, lower maintenance costs.

"Anti-Friction Engineering" is another vital link in the chain of features that makes Morgan cranes best in the business.

Performance records prove that advanced design and heavy duty construction of Morgan cranes make them less costly to operate and maintain. Let our representative show you how to save the most by buying the best . . . Morgan!



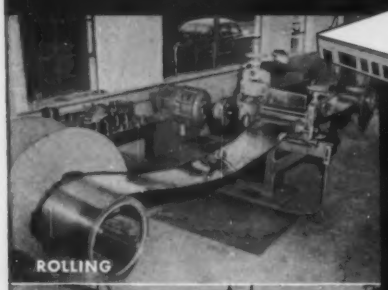
Morgan cranes are built with roller bearings throughout. Friction-free cranes increase service life, speed up response, require less power.

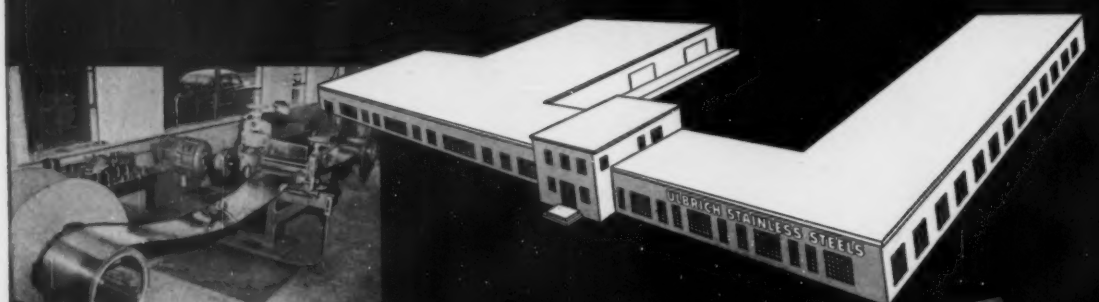


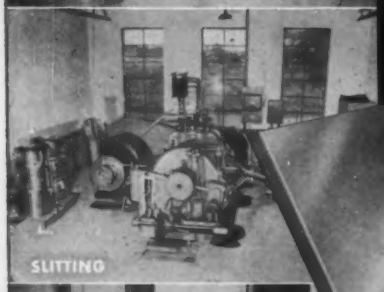
THE MORGAN ENGINEERING CO. *Alliance, Ohio*

The Morgan Engineering Company, founded in 1868, manufactures overhead electric traveling cranes, gantry cranes, charging machines, plate mills, blooming mills, structural mills, shears, saws, and auxiliary equipment.

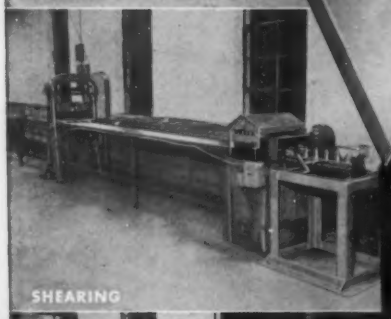
the biggest little mill in the country

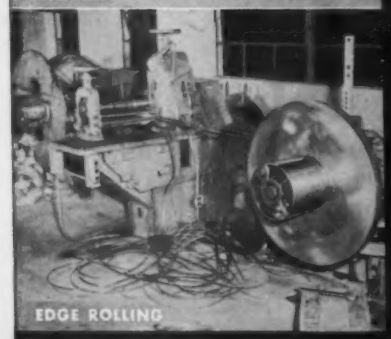






ULBRICH Stainless Steels





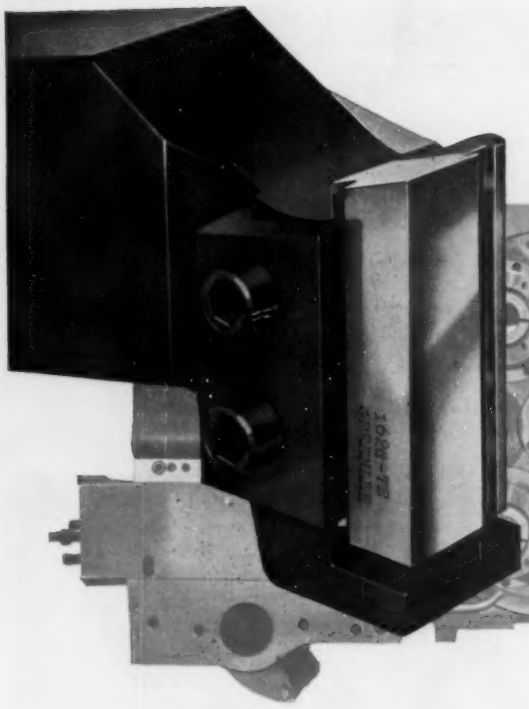
With more facilities than ever before
to convert **STRIP**, Flat Wire,
and other Stainless Steels
TO YOUR CLOSEST REQUIREMENTS—
EXACTLY AS YOU WANT IT.
One foot or one pound and up
rolled, slit, sheared, flattened,
edge rolled, annealed and
DELIVERED PROMPTLY.

ULBRICH Stainless Steels

Established 1924

WALLINGFORD, CONN.

Phone: COlony 9-7771



PRODUCTION MACHINERY

GREENLEE

INTER-CHANGEABLE TOOL HOLDERS FIT ALL CROSS-SLIDES ON GREENLEE BAR AUTOMATICS

They Save You Set-Up Time . . . Reduce Tooling Costs

Tool holders can be quickly and easily changed from one position to another . . . from one Greenlee machine to another (within their size range). All cross-slide cavities are identical . . . tool holders fit these cavities exactly. Greenlee Interchangeable Tooling is more *flexible* . . . more *efficient* . . . more *economical.* On short runs especially, the savings on setup time is considerable. Greenlee engineers will be glad to show you how to attain maximum production with a minimum number of tools and holders. Take advantage of this valuable service now.

Write Today For Catalog A-405

4-SPINDLE 6-SPINDLE
SECOND OPERATION
PNEUMATIC STOCK FEED

Do you receive a copy of the Greenlee "Automatic News" regularly? If not, write and ask to be placed on our mailing list. Give company name and job responsibility.

PRODUCTION MACHINERY

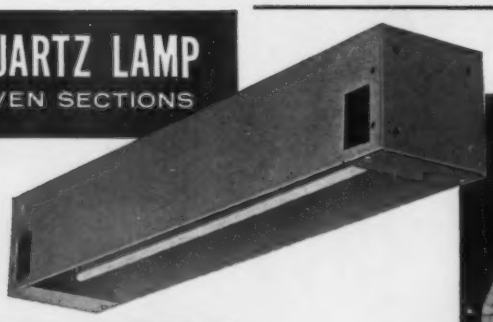
GREENLEE

GREENLEE BROS. & CO.
Rockford, Illinois
1808 Mason Avenue

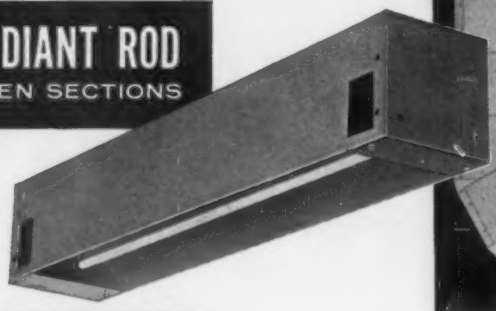
Check FOSTORIA'S Full Line of Radiant Heating Equipment...

Select Components or Complete Ovens from 3 SOURCES OF INFRARED ENERGY

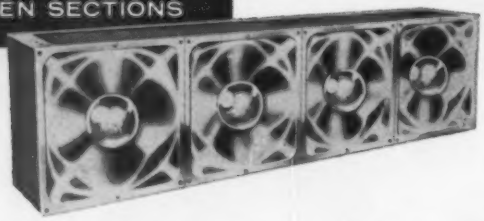
1 QUARTZ LAMP OVEN SECTIONS

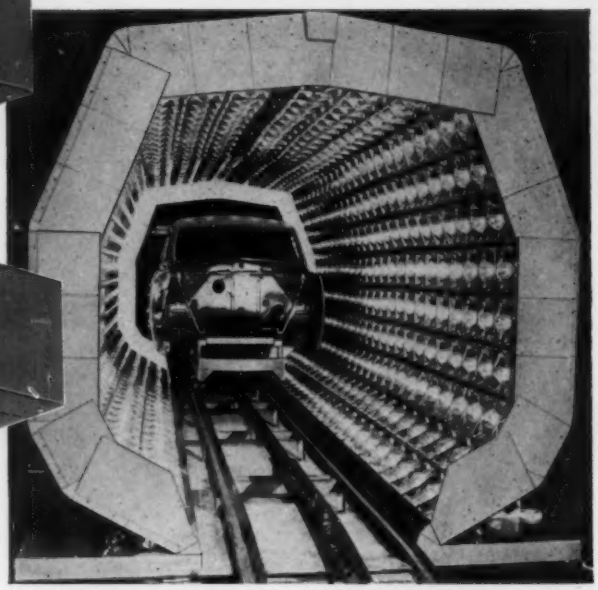


2 RADIANT ROD OVEN SECTIONS



3 INFRARED LAMP OVEN SECTIONS





Fostoria Complete Radiant Ovens

INFRA-RED fostoria SYSTEM

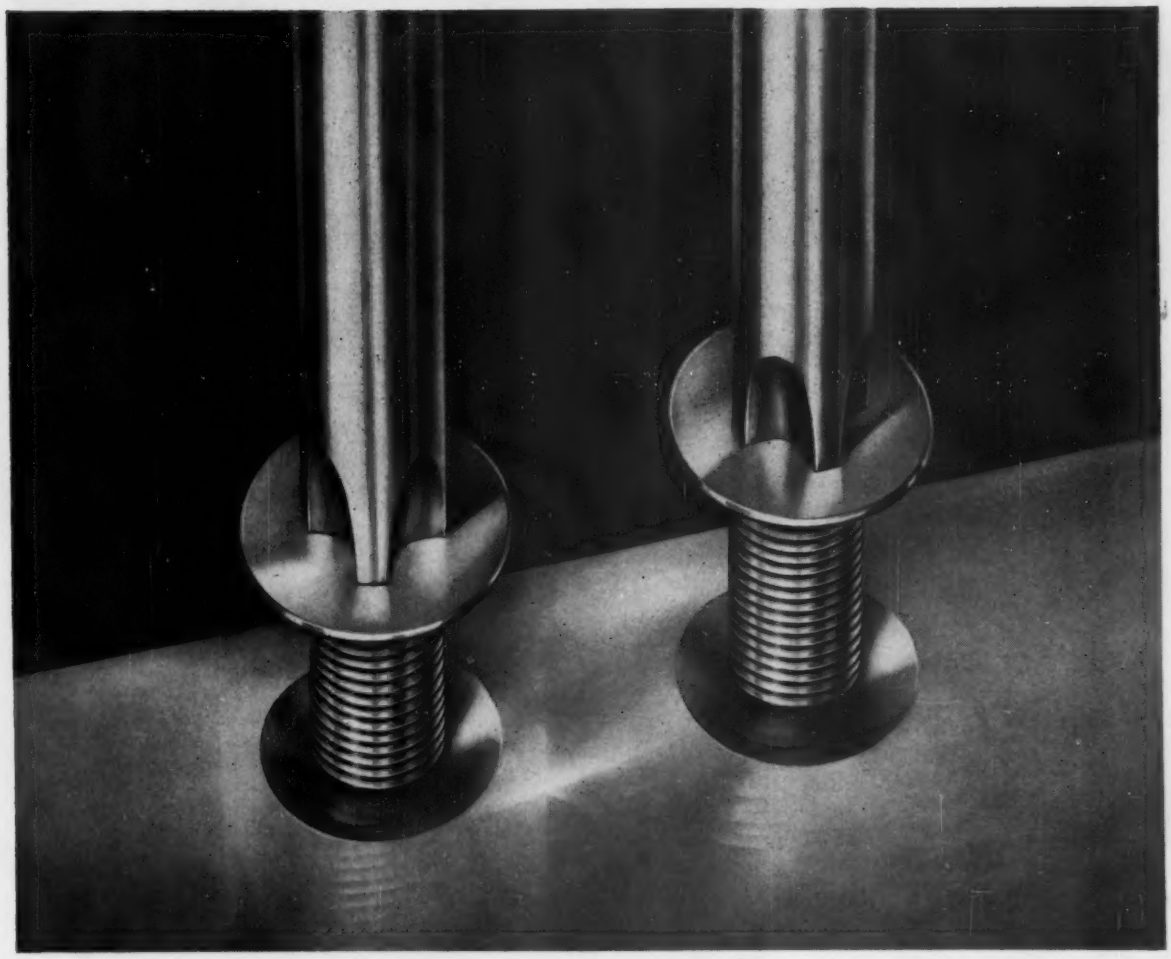
Whatever the industrial application for radiant heat, FOSTORIA can recommend and supply the *type* of equipment best suited for the job. The FOSTORIA line includes equipment incorporating *several sources:* **(1)** The new T-3 quartz lamp **(2)** Far infrared metal elements, and **(3)** G-30 and R-40 near infrared lamps.

Because Fostoria manufactures *a complete line* of sections, portable units and specially engineered ovens . . . *of all three types,* when you take your heating problem to Fostoria, you get an exclusive brand of heating "know-how," that is available *only* from Fostoria—the pioneer manufacturer of Radiant Heating Equipment. Get complete details on the FOSTORIA line today! See your nearby Fostoria Sales Engineer right away, or write direct.

Write Department 824 Today For Free Descriptive Literature 5500

FOSTORIA PRESSED STEEL Corporation • Fostoria, Ohio

Pioneer Manufacturer of Radiant Equipment . . . Components to Complete Ovens



They may Look the same but...

American is the name!

In your actual cost of modern fasteners are four things:

1. PRICE **3. QUALITY**
2. SERVICE **4. RESEARCH**

It is possible, as prices fluctuate, there may be places you can get a price differential at the moment. But no one gives you more of all four plus features than American.

American gives you more of all four

Certainly in service, where precision American deliveries keep any production line on schedule — like an automotive manufacturer who uses more than 600 million American Phillips fasteners a year.

Certainly in quality where qualitative checks at American are unmatched in the industry in such key areas as raw material identification and evaluation.

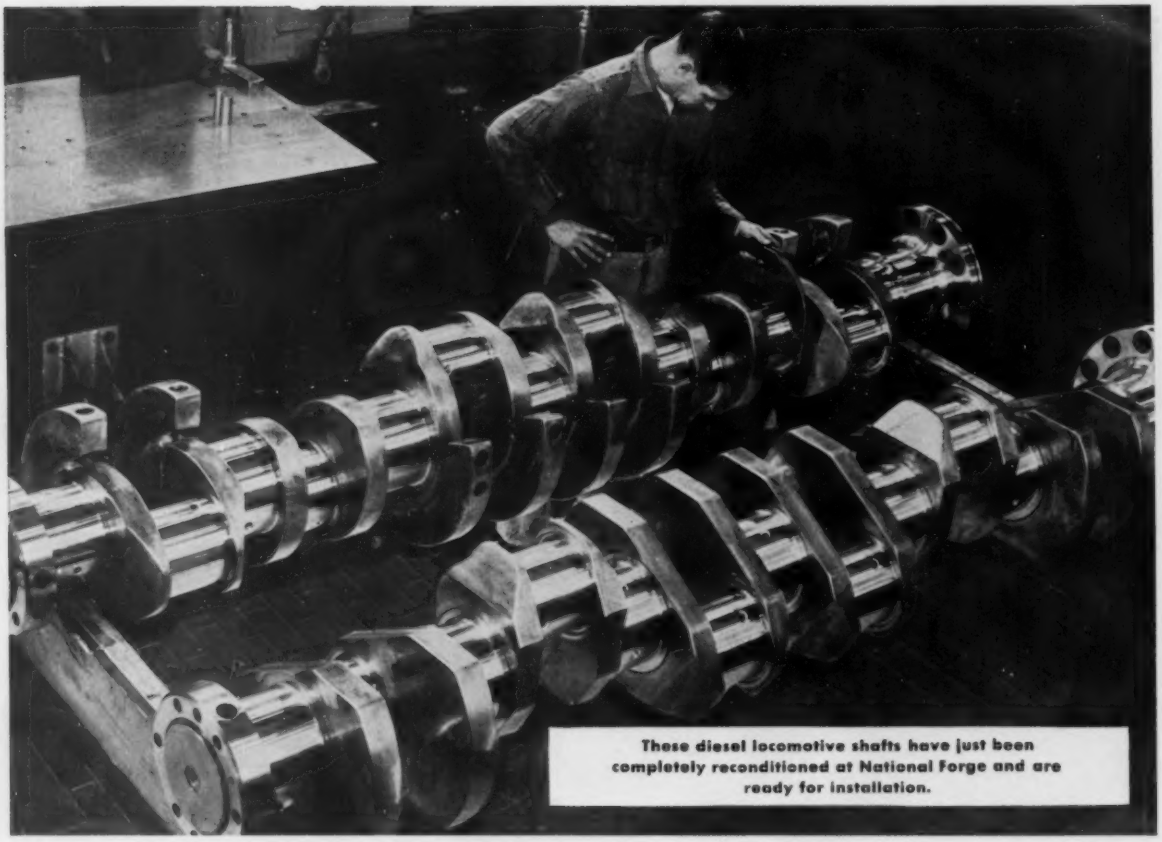
Certainly in research that has developed not only the Phillips Head fastener, but devised a fastener for an appliance manufacturer that cut fastening costs more than 50%.

Nowhere will you find more of the four basic product features you want than from American — price, service, quality, research.

Make your own comparisons ... send us your inquiry for price and delivery or your specifications for special fasteners. Write:

American!

AMERICAN SCREW CO. • WILLIMANTIC, CONN.
NORRISTOWN, PA. • CHICAGO, ILL. • DETROIT, MICHIGAN



These diesel locomotive shafts have just been completely reconditioned at National Forge and are ready for installation.

RECONDITIONING DIESEL LOCOMOTIVE SHAFTS

● National Forge has been well recognized as a supplier of quality crankshafts for original equipment for over forty years. Through these years we have kept abreast of the steadily increasing demands for greater quality and workmanship.

Now this experience and "know how" have been applied to the problem of reconditioning worn crankshafts. National Forge has established a complete and separate department for this rebuilding which includes a newly developed chromium plating process and facilities for straightening, grinding and polishing.

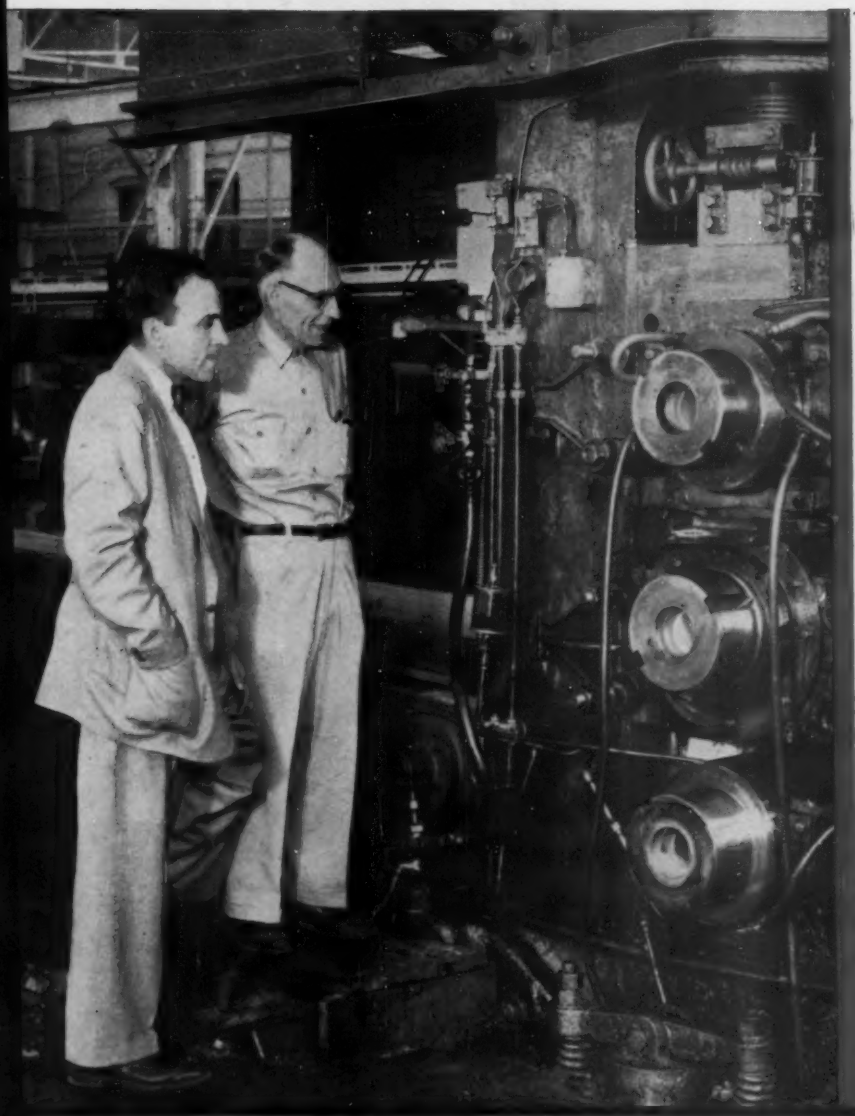
National Forge offers you this complete rebuilding service for your worn crankshafts. We will be pleased to have your inquiries and will be glad to have our field representatives discuss this service with you.

NATIONAL FORGE AND ORDNANCE COMPANY

PRODUCES BETTER STEEL FORGINGS AND MACHINE WORK

IRVINE, WARREN COUNTY, PENNSYLVANIA

Sick slab roll recovers fast with application of STANOGEAR *Compound*



A slab roll at Matthiessen & Hegeler Zinc Company, La Salle, Illinois, was sick. It suffered from repeated roll neck bearing failures. Bearing temperatures couldn't be controlled. A consultant was summoned—Marshall J. Fox, Standard Oil lubrication specialist. His diagnosis and remedy: Install STANOGEAR Compound and equip the machine with a central pressure system for application. Recommendations were followed. Result: No bearing failures, due to faulty lubrication, since. Maintenance costs reduced. Time lost through breakdowns slashed.

This was a condition made to order for STANOGEAR to remedy. And Matthiessen & Hegeler knew there was a man at hand who could suggest what should be done. It's another demonstration of what this unbeatable combination can do when put to work:

1 **Standard Oil lubrication specialists capable of giving technical help.**

2 **Top quality products *that deliver results required.***

STANOGEAR Compounds contain special additives making them suitable for applications where heavy loads cause welding, seizure or scoring.

In the Midwest and Rocky Mountain states, a Standard Oil lubrication specialist in your nearby Standard Oil office will gladly give you more information about STANOGEAR. Call him. Or contact Standard Oil Company, 910 So. Michigan Avenue, Chicago 80, Ill.

Eugene Ewald (right), Mill Foreman, and Marshall Fox, Standard Oil lubrication specialist, inspect slab roll. STANOGEAR Compound helped solve lubrication problem on roll neck bearings.

Marshall Fox who proposed switch to STANOGEAR with resultant improved operation, is experienced in providing such technical service. Marsh has a Mechanical Engineering degree from Purdue to qualify him for this work. In addition, he has completed Standard's course for sales engineers. This experience and training, customers find, pay off *for them.*

STANDARD

STANDARD OIL COMPANY

(Indiana)

Time Tested

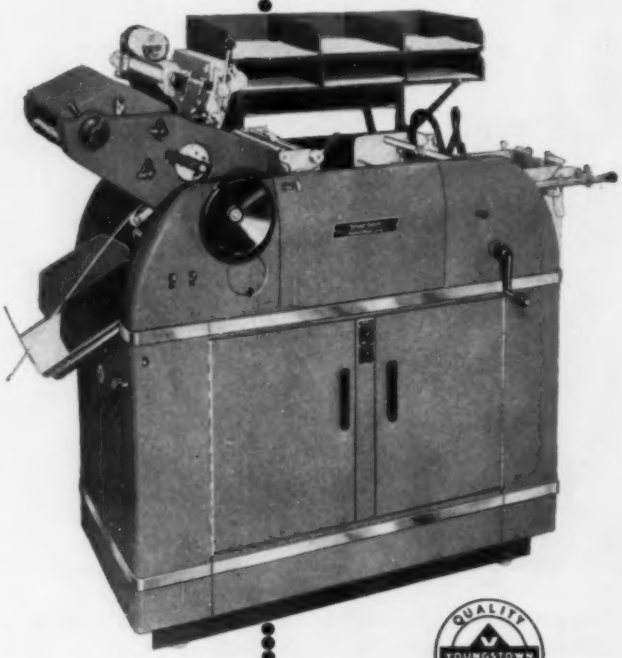
ADDRESSOGRAPH-MULTIGRAPH BUSINESS MACHINES

are created with quality in mind

... that's why **YOUNGSTOWN STEEL**

is specified as a basic material

Multigraph **Multilith Offset** Duplicator, one of many production machines for business records manufactured by Addressograph-Multigraph Corporation, Cleveland, Ohio.



It's apparent in many quality products you see every day: Perfection of manufacture starts with the basic material. And, with Addressograph-Multigraph, as with many other quality manufacturers, a basic material is Youngstown Steel—cold finished bars and cold rolled sheets.

Youngstown Cold Finished Bars have desirable uniformity and machineability. Injurious seams, cracks and other imperfections do not occur. Youngstown Cold Rolled Sheets have the right temper that makes them easier to form. That means fewer rejects and better fabricated products.

You are hours, dollars and energy ahead when you specify Youngstown. Get in touch with our nearest Youngstown District Sales Office for complete information.

QUALITY YOUNGSTOWN SERVICE

Youngstown **COLD FINISHED BARS**
COLD ROLLED SHEETS

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices Youngstown, Ohio District Sales Offices in Principal Cities.

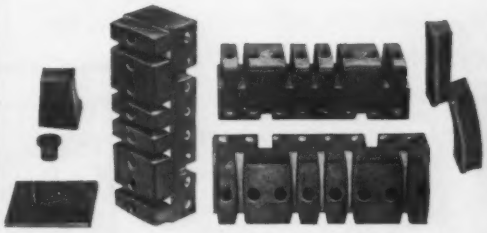
SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - BLACK PLATE - RAILROAD TRACK SPIKES - MINE ROOF BOLTS

B&W Silicon Carbide Refractories for metal-working furnaces

To meet the specialized requirements of the primary metals industry, B&W manufactures Silicon Carbide Refractories in a variety of shapes and sizes. These durable refractories are produced in B&W's Augusta, Ga., works to the same rigid quality control standards used in making all B&W Refractories. See your local B&W Refractories Engineer for further information.

B&W Silicon Carbide Rolls

B&W Silicon Carbide Recuperator Tubes



B&W Silicon Carbide Special Shapes

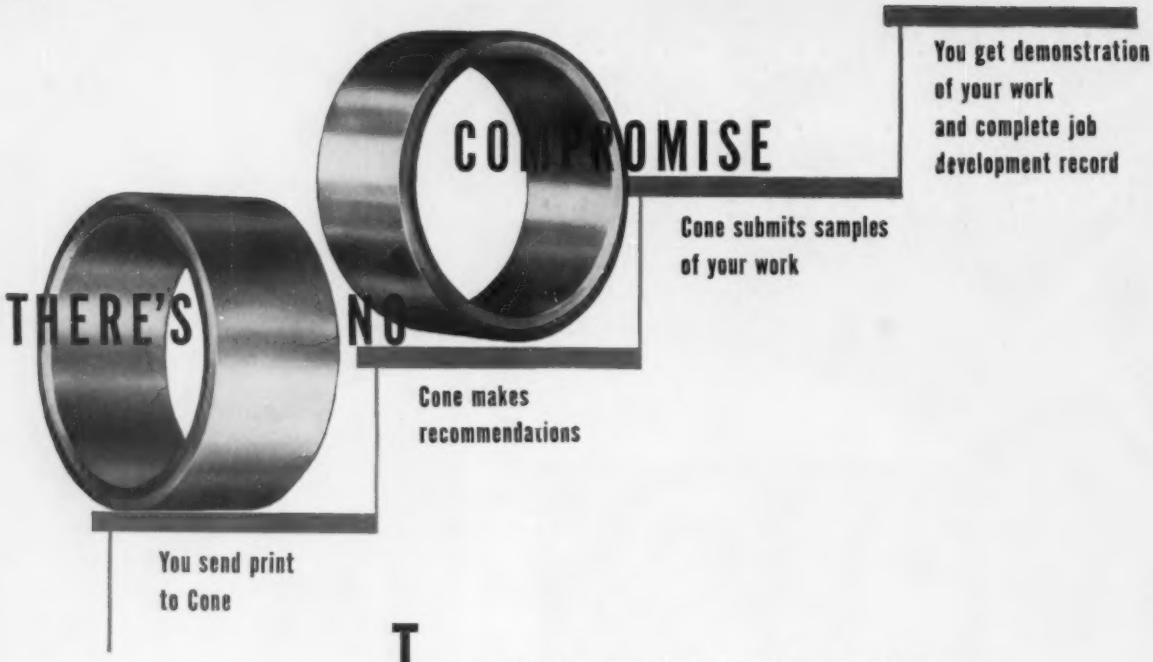
BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 161 EAST 42nd ST., NEW YORK 17, N.Y.
WORKS: AUGUSTA, GA.

B&W REFRACTORIES PRODUCTS: B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick • B&W Refractory Castables, Plastics and Mortars • B&W Silicon Carbide

R158

No. 6 in a series


THERE'S NO COMPROMISE
You get demonstration of your work and complete job development record
Cone submits samples of your work
Cone makes recommendations
You send print to Cone

There is no adequate compromise with efficient production practices, if you are in business for a profit.

But you don't always know just how competitively efficient your equipment is. Case histories of what the other fellow is doing are sometimes garbled. At least the poor ones are not advertised. And conditions vary in all plants. Sometimes you have reason to be more concerned with what you don't want in new equipment than with what you do want. Cone believes too much is at stake for a machine to go into a line unequipped for the job, with either carbide or hss tools.

The Conomatic Carbide Development treats each job individually from standpoint of work, machine, tools, and operating personnel.

DATA FOR COMPARISON

Part	Bushing	Length	5/8"
Machine	1 5/8" Conomatic	Hole Dia.	1 1/4"
Tools	100% Carbide Tipped	RPM	825
Material	8620	Time	14.8 Secs.
Stock Size	1 5/8"		

Conomatic

For particulars send for "Four Steps With Cone"

CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U. S. A.

Held at 3000°F for five hours, these four brick, commonly recommended to resist high temperatures, show varying effects. Samples 1, 2, and 3 softened and slumped to different degrees, indicating loss of usefulness even below this temperature. Sample 4, a Mullfrax® electric furnace mullite refractory, is unaffected by the heat.

fourth in a series . . . **HEAT RESISTANCE**

Unusual Properties of Refractory Materials

Heat Resistance—Exposed only to heat, Carborundum's Super Refractories can actually be used with complete safety at temperatures above 3000°F. Long before such temperatures are approached, even high heat duty and super-duty firebrick lose much of their usefulness. That's because they begin to soften several hundred degrees below their theoretical safe limits. Not so Carborundum's Super Refractories. Their strength and rigidity are maintained close to their theoretical limits.

In practice, of course, you must contend with many more conditions than heat alone. Corrosion, thermal shock, load, abrasion, erosion, etc., are usually combined with temperature. This combination of conditions may tend to lower heat resistance of refractories. That's why a refractory cannot be selected solely on its ability to withstand temperature. It also explains the reason Carborundum offers so many specialized refractories.

Heat resistance is thoroughly explored in the forthcoming issue of Carborundum's new magazine "Refractories." Send for your copy today.

CARBORUNDUM
Registered Trade Mark

VALUABLE INFORMATION FOR USERS OF:

REFRACTORIES • CASTABLE CEMENTS • POROUS PLATES AND TUBES

CATALYST SUPPORTS • OXIDE, BORIDE, NITRIDE AND CARBIDE

HIGH-TEMPERATURE MATERIALS • CERAMIC FIBER

all in the new magazine "Refractories"

—MAIL THIS COUPON TODAY—

Dept. B86, Refractories Division

The Carborundum Company, Perth Amboy, N. J.

Please send me the forthcoming issue of "Refractories."

Name_____ **Title**_____

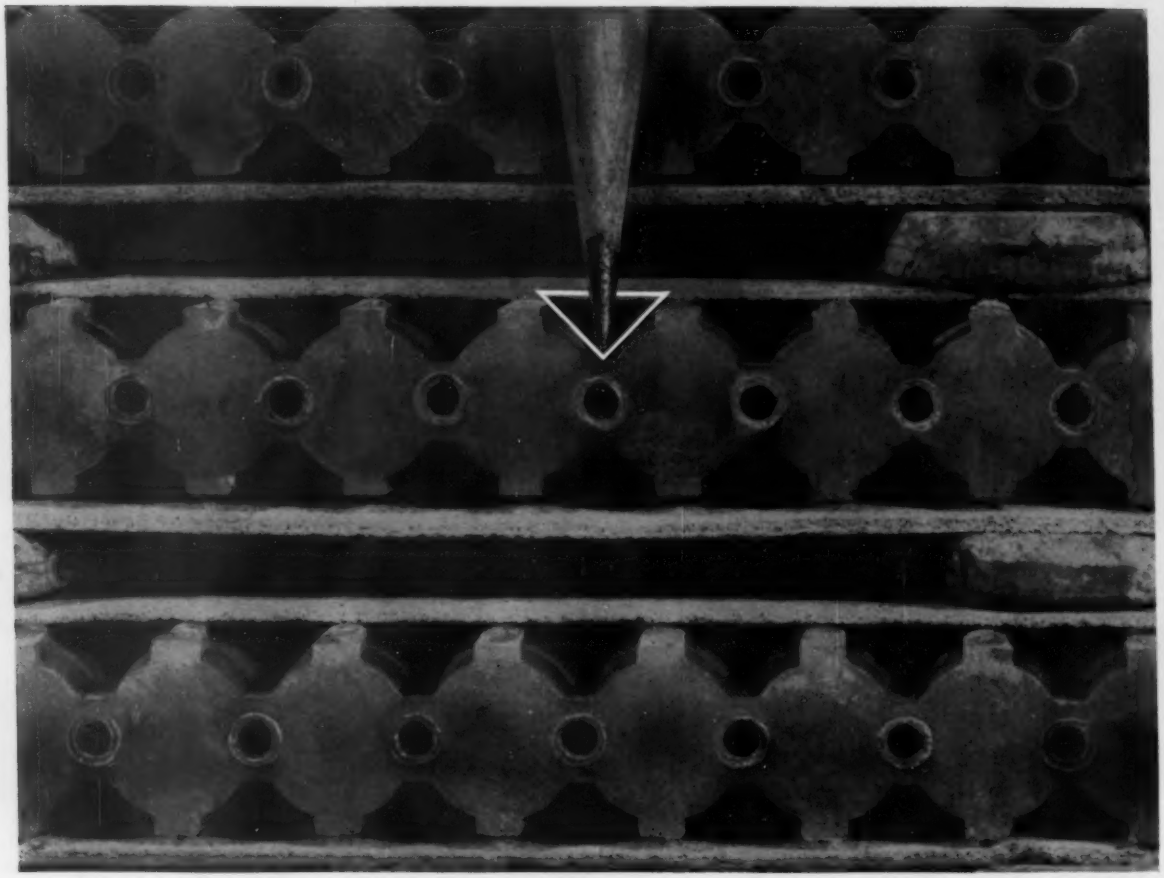
Company_____

Street_____

City_____ **Zone**____ **State**_____

EXIDE-IRONCLAD BATTERIES

For electric industrial truck operation



BOTTOM VIEW shows tubular construction of positive plates in an Exide-Ironclad Battery.

Pools of electrolyte next to plates speed heavy load response

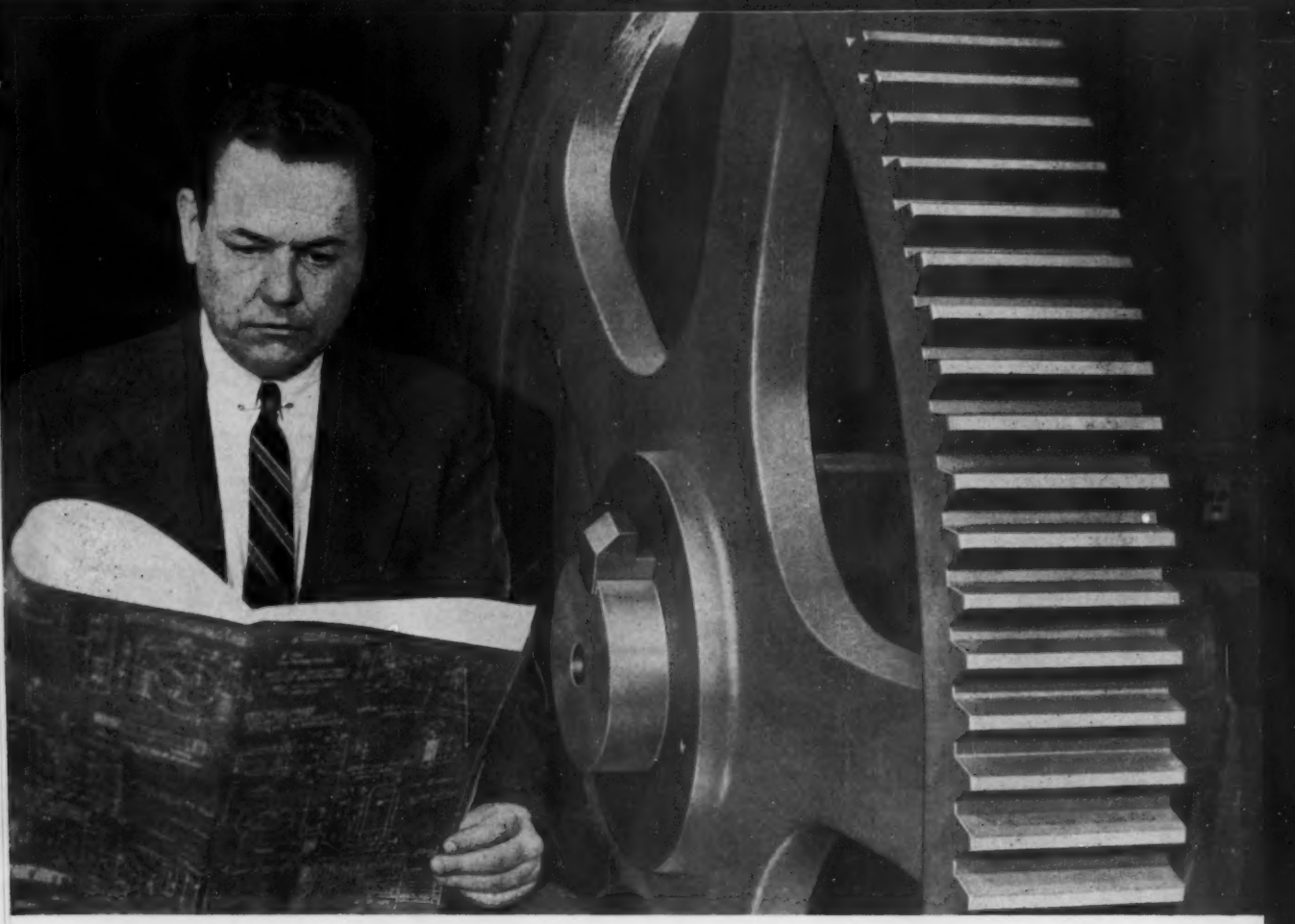
BATTERY FOR ELECTRIC INDUSTRIAL TRUCK. Exide-Ironclad Model TH. Write for Bulletin No. 5161.

When the man at the control says "More power—fast," the positive plate in the storage battery says "More electrolyte—instantly." That's why the Exide-Ironclad Battery can meet heavy load demands so much more rapidly than other types of batteries. And it's the reason they outperform others in so many uses.

Adjacent to every positive plate in the Exide-Ironclad Battery are these triangular pools of electrolyte standing in reserve. When the call comes for power, the electrolyte is right there where it's needed for swift, sure response. There's nothing to slow down the action. Tiny slits in plastic power tubes let electrolyte in—yet prevent loss of active material. Only the Exide-Ironclad Battery has this construction.

This exclusive feature is only one of the many reasons Exide-Ironclad Batteries have proved so superior in countless applications. When you order batteries for heavy duty service, or the equipment that requires such batteries, be sure to specify Exide-Ironclad. Write for detailed bulletin. Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pa.

Exide®



The gears in an automatic nut former have to be tough and strong to withstand heavy, varying loads. Yet, the castings from which they're made should be easy to machine. That's why this gear for a Waterbury Farrel Automatic Nut Former is made from ASTM-50 gray iron with a nominal composition of 1% nickel and .50% molybdenum.

Moly gives cast iron gears higher strength with toughness and good machinability

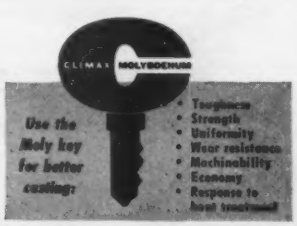
"To insure a tough, easily machined gray iron for the gears in our Automatic Nut Formers," says Henry C. Griggs, Metallurgist for Waterbury Farrel Foundry & Machine Co., "we specify .50% molybdenum in our ASTM-50 material. The properties of this material contribute importantly to the reputation of Waterbury equipment for accuracy and high speed production under severe operating conditions."

Molybdenum helps to give reliable and reproducible castings – very important factors in consistent performance of gears.

Investigate moly irons. They may be the key to better performance in many of your gear applications.

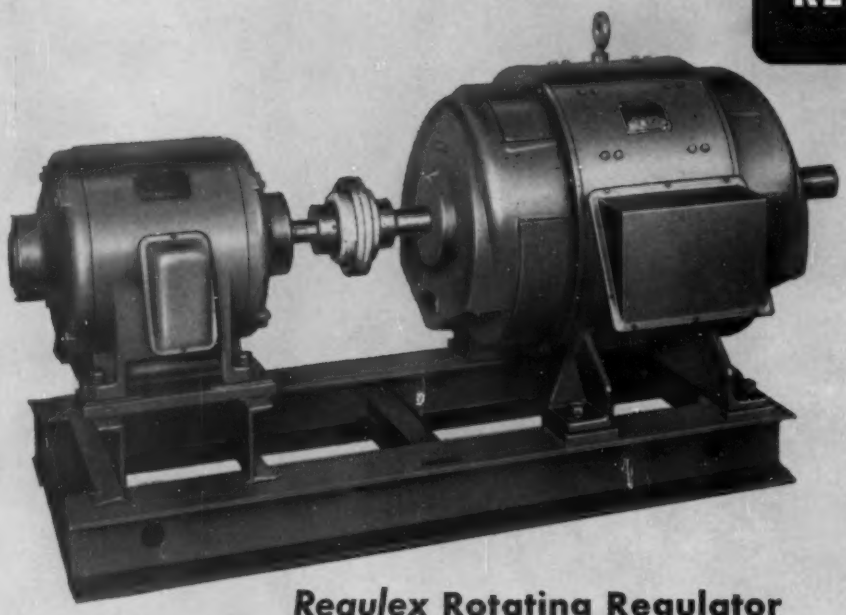
For the first two in a series of bulletins, "Why Moly Iron," or for technical assistance, write Climax Molybdenum Co., Department 20, New York 36, N. Y.

CLIMAX MOLYBDENUM



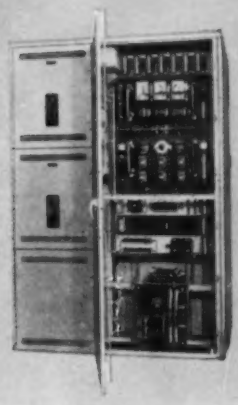
A Type and Size for Your Specific Needs

ALLIS-CHALMERS REGULATORS



***Regulex* Rotating Regulator**

Regulex regulator consists of m-g set and cubicle containing static elements. Cubicle may be combined with switchgear.



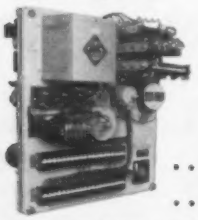
- Stability during high power-factor operations.
- Increased operating limits through automatic minimum excitation.
- High sensitivity and rapid response.

How It Works . . .

Automatic minimum excitation permits generator operation close to stability limit — much closer than manual operation. Sensitivity and quick response of *Regulex* regulator establish and maintain safe ratio between generator load and field current.

Where It Is Used . . .

In power plant application for voltage regulation of large generators or synchronous condensers. In industrial applications for regulating current, voltage, speed, tension, and reversing of processing mill equipment, and for arc-furnace control.



Magnetic AMPLIFIERS

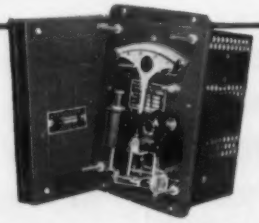
. . . Low maintenance

. . . High sensitivity

Designed for applications requiring high sensitivity and response, where regulator is subjected to shock, or where continuous performance is a prime factor. Used in conjunction with *Regulex* unit when reversed polarity output is required. Since the magnetic amplifier has no moving parts it requires little maintenance.

For complete information call your Allis-Chalmers representative, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

Electromechanical *Rocking Contact* Type Regulators



For voltage regulation of smaller ac and dc generators.

- Varies resistance in exciter shunt field by rocking action.
- Quick regulation over entire range with short movement.
- No sluggish relays.
- No vibrating or sliding contacts to wear.

Regulex and *Rocking Contact* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

A-5073

NEWSFRONT

Nickel—How Much This Year?

Some 260-million lb. That's about the total amount of nickel available to both defense and non-defense users this year, as things now shape up. Of this, about 68-million lb comes from supplies normally fed into government stockpiles, but now available to defense users. Mills and foundries will set aside roughly another 24-million lb, for fourth-quarter defense-user requirements.

Better Boring, Less Cost

Designed to use carbide tips, a new type of micro-adjustment boring tool for precision boring of metals reduces costs, eliminates the need for tool grinding. When all cutting edges of the carbide tips dull, they are simply removed and thrown away.

Search Picks up Steam

ODM's hunt for substitutes for strategic and critical minerals and metals is rolling. Several projects in the program have been assigned by ODM to other agencies; others soon will be. First authorized in the 1955 extension of the Defense Production Act, the program was renewed this year.

Anodizers Like the Auto Outlook

Aluminum anodizers are bracing to meet bigger auto industry demands. Three of the prestige cars sport anodized aluminum grilles this year—two in color. Anodizers think this presages a trend to colored grilles in lower-priced 1957 models.

Master Sorter Works Automatically

Bureau-of-Standards developed, a microimage data storing and retrieving device permits quick automatic finding, photographing of any of 10,000 information-containing frames. These would have been previously recorded in miniature on a 10-in. square sheet of micro-film. NBS says the machine's intended for government agency use. It's reported particularly useful where large volumes of data must be put together, in a predetermined sequence, from a master random file.

Who's For Radial Draw Forming?

Although it's seldom lumped in with other "chipless production" methods, radial-draw-forming technique keeps attracting new converts. Behind it is pressure for ever-more streamlining of consumer, military goods. Universal machines fabricate high strength-to-weight ratio alloys, in many rolled and extruded forms, into precision one-piece components. Finished products are stronger due to cold-working effects; costs are less.

Spray Gelled Paint

Look again at thixotropic paint, that which gels if not agitated. Now available in alkyd-resin bases, one paint maker promises lacquers and baking enamel finishes are not so far away. The paint reportedly wets steel better than conventional paints, hence adheres faster. There's a good chance of spraying it too.

Aircraft Castings Program Coming?

Government would spend up to $1,250,000 annually to encourage use of high-strength precision castings in aircraft fabrication, if it follows recommendations now before it. Special panel of experts representing airframe, steel and research industries made the study at Defense Dept. request. Several-years-long program recommended would serve to relieve a bottleneck in industrial forging and machining capabilities under mobilization conditions.

Aluminum Shields Watt-Hour Meters

Lightning bolts and heat waves make home watt-hour meters run faster—an unfortunate effect now being overcome with a simple, inexpensive drawn-aluminum shield. Pittsburgh-area power company which developed the device finds it sets up an opposing magnetic field in the meter. This counteracts surge effects of lightning, deteriorating rays of extreme heat.

Wright cranes keep engines flying through world's largest line-maintenance hangar

...with the help of 480 TIMKEN® bearings

24 motor-driven Wright cranes like the one shown keep engines winging from station to station in the world's largest line-maintenance hangar at Miami. And keeping the cranes on the go are 480 Timken® tapered roller bearings on the bridge wheels and trolley wheels.

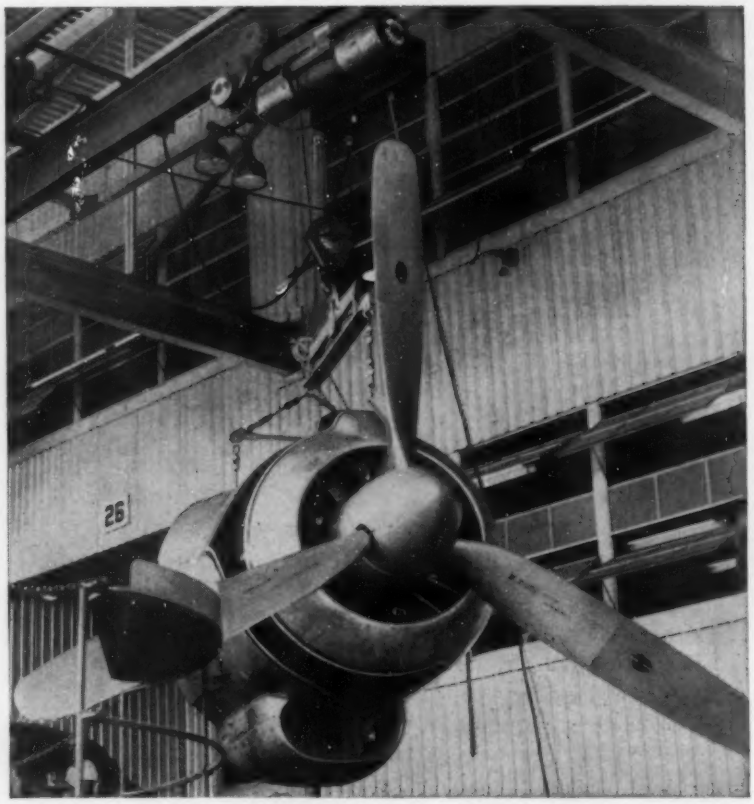
Timken bearings take both the radial loads imposed by the weight of the engines and the thrust loads set up by the pendulum motion of crane operation. The tapered design of Timken bearings lets them take radial and thrust loads in any combination. And full line contact between rollers and races gives these bearings extra load-carrying capacity. Downtime is cut, cranes are kept on the go.

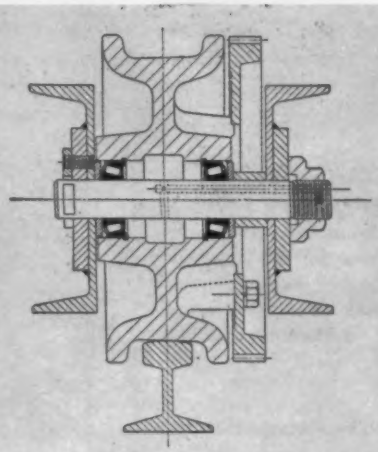
Friction is virtually eliminated with Timken bearings. They're designed by geometric law to have true rolling motion—precision manufactured to live up to their design. Cranes roll smoothly with a minimum of wear and maintenance. And to take the shock loads often encountered, rollers and races of Timken bearings are case-carburized to give them wear-resistant surfaces over tough, shock-resistant cores.

Be sure you specify Timken bearings when you build or buy a machine. To give you the *finest* roller bearings, we even make our own fine alloy steel. We're America's only bearing manufacturer that does.

Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

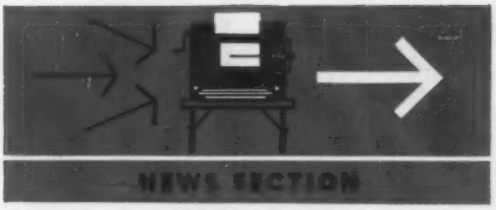




How the **WRIGHT HOIST DIVISION** of American Chain and Cable Co. mounts Timken tapered roller bearings on the truck wheels of its cranes to take the loads, keep them on the go.

TIMKEN *TAPERED ROLLER BEARINGS ROLL THE LOAD*

TRADE-MARK REG. U. S. PAT. OFF.



Is Industry's Water Level Too Low?

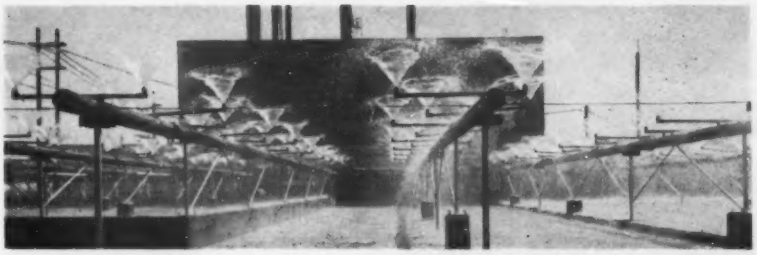
Water shortages are acute in some areas . . . Total supply seems adequate, but economical use and better distribution is necessary to assure future requirements . . . Examples cited—By G. J. McManus.

◆ INDUSTRY has got to have water. U. S. plants use 80 billion gallons a day now, will need three times that much by 1975.

Water shortages are acute in many areas. They threaten to spread as consumption increases.

Water economies have saved money for some plants, enabled others to keep operating.

These facts have set management to wondering about water. Those who have made thorough studies say there is no reason for panic in most cases but plenty to think about in all cases.



THIS 2 million gal "lake" at National Reactor Testing Station, Idaho, points out need for water in modern and future industry. It is used to cool water heated by atomic engine built and tested by Westinghouse.

Supply and Demand

On the reassuring side, they point to the overall U. S. water supply. The country as a whole is not running out of water. The same amount of rain falls as in the old days. Weather people have detected no lasting change in precipitation and don't look for any.

COOLING and clarifying system at Kaiser Steel conserves water.

What changes is the rate of water use. U. S. consumption has been doubling every 25 years since 1900. There's no sign of a lag in this rate and the country could eventually go into trouble. But right now, there's a lot more water falling than is being used. Even with most rainfall going right back to the atmosphere, we're only taking 15 pct of the water that is added to the available supply each day. By 1975, total use will be about a third of the daily supply.

Distribution

The difficulty lies in uneven distribution and use of water. Western states get about one third as much rainfall as the eastern part of the country.

California is meeting this problem by reaching back into the mountains to tap the Colorado, San Joaquin and other rivers. With more than 75 dams and a network of canals, the state used 40 pct of the ground water consumed in the U. S. and is raising its water table.

The Texas Gulf Coast has had a similar problem develop. Industrial growth increased water consumption and lowered the water table along the Gulf. This brought a threat of salt water seepage. A system of reservoirs is being developed to catch more surface water but the region still has a problem.

The water problems of the West have been highly publicized and they are real problems. A company moving into any of the rainshy states wants to make sure of its water rights. Each piece of property carries the right (which can be sold separately) to a certain amount of water.

But in locating a new plant, you can't assume that an area well stocked with rain and streams always will have enough water. Industrial buildups have created water problems throughout the country.

New York, New Jersey and other states of heavy rainfall have had to scramble for water in recent years. Louisville had a close squeak in the last war when an

The Facts About U.S. Water Supply	
Volume	Rainfall — 4300 billion gallons daily. Consumption — 180 billion gallons.
Industry Use	Aluminum — 8000 tons per ton of product. Viscose Rayon—800 tons per ton of product. Paper Pulp — 210-625 tons per ton of paper. Steel—80-145 tons per ton of steel.
Application	Cooling—¼ of average plant's total. Sanitary—¼ of average plant's total. Process — ⅜ of average plant's total. Boiler—⅛ of average plant's total.

How To Save Water	
One GE plant	saves $100,000 a year by: Refrigerating water that cools machines. Recovering water from an in-plant spring. Installing shut-off valves on welders. Regulating urinal flushing. Provision of water towers.
Kaiser Steel	saves 55,000 gal per ton of steel by: Recirculation of water. Reuse of water in successive operations. Using coolers in series. Use of counter-flow principles in pickling and cleaning lines. Using dry systems for air pollution control.

SPECIAL REPORT

industrial boom suddenly began drying up the water supply. Only the discovery of a new water source nearby saved a costly piping project. The Monongahela River, which cools steel furnaces near Pittsburgh, would have been a muddy gulch in 1953 without replenishment from man-made reservoirs.

In addition to water volume, there is the question of quality to be considered. San Francisco water has 13 lb of dissolved solids per million lb of water (ppm) as against 1040 ppm in Dallas. About half the water used by industry in New York is salty or brackish. These variations mean varied degrees of treatment for industrial water. They can mean needless expense for the company that picks a site with water not suited to its operations.

How to Conserve

In the case of the company that is not planning new sites, water still rates plenty of attention. General Electric at its Electronics Park plant near Syracuse, N. Y., cut water costs more than $100,000 a year through a conservation program. Kaiser Steel Corp. has dropped water use for steelmaking to 1600 gal per ton of steel. This compares with a national steelmaking average of 65,000 gal per ton.

These savings, plus conditioning problems, have led companies to call in water experts. Hall Laboratories, Inc., Pittsburgh, keeps a year-round watch over the water worries of 2000 companies, tests as many as 1200 water samples a month.

There are, however, four general ways of stretching water supply: by reducing waste; by reusing water in the same operation; by reusing water in different operations; and by finding a new source.

Waste Control

Water meters have proved a useful tool in analyzing water use and cutting waste. According to the Neptune Meter Co. of New York, too few companies pinpoint their water consumption. Meters enable plants to break down water consumption by department, to locate hidden leaks and to make supervisors conscious of waste.

General Electric found meters were very helpful both in devising and measuring the success of conservation programs. Other economy steps taken by GE include: the installation of automatic or manual shutoff valves for plating line rinse water; use of flow regulators, scaled to operating needs; replacing running water rinses with a spray.

One point to remember is that little trickles add up to bigger water bills. GE thought it worthwhile to change to flushing valves of urinals for proper flow (the average person flushes away 7 gal a day). Americans use about four times as much water per man as Europeans.

Recycling

Reuse of water in the same operation is widely practiced in steam generation. U. S. plants reuse about 70 pct of their steam condensate. On the other hand, most steel plants simply run cooling water once through furnaces, taking in about 100 tons of water for every ton of steel produced.

These figures are a little deceptive. The seemingly prodigal use of water in steelmaking results in little actual consumption. Water just flows through the mill and back to the river.

On the other hand, one pound of water is lost for every pound of steam produced, even though the steam condensate is reused. Reason for this is that the cool-

PLANNING AHEAD FOR WATER

CAPACITY of Beaver Run Dam, above, in Pennsylvania was influenced by requirements of steel companies for industrial water when rivers formerly supplying them were no longer usable or dependable.

ing water of condenser systems evaporates off when it is passed over open roof towers.

Moreover, any reuse of water increases the need for treatment to prevent scale, corrosion and slime in the circulating pipes. For this reason it may be cheaper to use water only once if there is a plentiful supply and it is to perform a simple cooling function. In cleaning, boiler and process applications, fairly extensive water conditioning will be necessary in any case.

Multiple Use

Kaiser's water system at Fontana provides an example of water use in successive operations. All water coming into the plant is chemically treated for reduction of solids. Domestic supply and boiler water are taken off. The industrial supply is supplemented by plant waste water and flows first to systems requiring the highest quality. From there it goes to applications with less critical requirements and finally it winds up in the blast furnace gas washing system.

Leaving the washing system, water is taken to cooling towers and recirculated. In this manner, Kaiser salvages about 55,000 gal for every ton of steel produced.

Government's Role

Regarding future provision for handling water, authorities say the country will be in serious trouble if vigorous action is not taken. Public water works men say 40 pct of U. S. cities have inadequate water systems, that we should spend nearly $1 billion a year for the next 10 years, just to catch up on deficiencies.

National Rivers and Harbors Congress wants the government to spend $242 million on flood control and harbor projects.

The President's new water program calls for $80 million to be spent in collecting data on water.

Everyone agrees there must be action but the problem is so big it's difficult to devise a coherent plan. The program submitted by the President early this year called for tighter policing of water resource expenditures, greater cost sharing by direct beneficiaries of projects, and a push for local operation and construction.

Technical Aid

Regarding new developments on the water scene, the country still has a long way to go before it can compete with nature in the production of water. Salt water distillation costs run around $1 per 1000 gal of water produced. This compares with an average industrial cost of about 10¢ per 1000 gal.

Cloud seeding to produce rain is done on a commercial basis in the West. Coke impregnated with sodium iodide is burned. The iodide particles induce moisture condensation in rain clouds. The trick in dry areas is to find the clouds.

Westinghouse Electric Corp. has developed a flash evaporator that uses low temperature waste heat to convert sea water into commercially pure water. One of these units is slated for commercial use overseas.

But the best device turned up so far for providing water when it is needed is the reservoir. In the upper Ohio River system—above Pittsburgh—there are ten of these. Five are dual purpose. They store water for release during dry spells.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, *Chestnut & 56th Sts., Philadelphia 39, Pa.*

LABOR

STEEL: Behind Strike Settlement

Steel labor got more than it expected . . . But pressure from two cabinet officers helped break the deadlock . . . Industry got out from under one-year contract . . . Future problems—*By Tom Campbell.*

◆ STEEL management gave McDonald more than it had hoped to settle for originally. But the silver-haired steel labor chief got help from an unexpected corner.

The assist came from two cabinet officers who formed a "persuasion" team. Both worked their own side of the street and compared notes. Secretaries Humphrey and Mitchell are the two men who devised the "unofficial" technique.

The industry got its three-year breather but its cost came high. Mr. McDonald got a good package and a little more than he expected. But he does have to get used to the three-year stretch—and tougher bargainers.

Steel negotiators John A. Stephens, veteran U. S. Steel Industrial Relations V. P.; Tom F. Patton, Republic's assistant president; John Morse, Bethlehem's counsel and Heath Larry, U. S. Steel's counsel, had some frustrating moments.

In the process of getting their baptism under fire, the steel lawyers learned much that will come in handy during the next contract period. They learned that past negotiations in which Jack Stephens and U. S. Steel bore the brunt weren't as easy as they were cracked up to be.

Lessons Learned

It is safe to say that many of the 12 steel company presidents now know a lot more about the pitfalls of collective bargaining than they knew before this hassle started. It is a good bet that communications will have to be improved the next time there is industry bargaining.

Some time the steel firms will learn the lesson coal operators did. A big group or lots of committees are no guarantee that things will be done right. Part of this has been learned already.

The Big Three (U. S. Steel, Bethlehem and Republic) experiment was a suggestion of management not the union. It has been classed as a success. Whether John Stephens becomes a permanent chairman of the group some time in the future remains to be seen. The industry would think twice before turning down an opportunity to use this experienced battler.

It was obvious in the steel negotiations that the press bothered management and labor. Some of this feeling is understandable. But at the same time this aloofness suggests that even now some steel and labor people have no idea of what the government and the public may have in store for them in later years.

Seat For Public?

The steel firms got down to brass tacks in this strike because of pressure from the outside—and inside. There are those highly placed in Washington who feel the public should be represented—or protected—in some way when basic industry and big unions get together.

The steel industry is caught in the web of the powerful steel union. If and when there are counter measures against the union on the part of the government or the public, the steel industry will suffer also. That is the opinion of those close to the periodic wage-price-inflation hassle.

Until the strike shut down most of the industry there were many highly-placed industrialists who believed the steel fight was window dressing. They figured things were cut and dried long before the negotiations started.

Whether such thinking is correct has no bearing on the effect it may have on steel and labor. It could be the basis for a ground swell of investigations, accusations, and finally some kind of a strait-jacket.

Deep Overtones

The overtones of this latest steel wage settlement run deep. They will be significant. There are those in industry and in labor who know that a "public" conscience is now a must—under any administration. That is why many are now wondering just what management and labor will do during the three-year breather.

Unless this extra time produces something other than a strike followed by a big wage package, some in government fear for the public. And they claim privately that something "should be done" after proper study. Best bet is we could be entering a statesmanship period in steel-labor relations.

Tax-Am For Steel?

Office of Defense Mobilization is waiting for the Business and Defense Services Administration to complete studies on the need for fast tax amortization on heavy steel plate and structural steel expansion. In its final decision, ODM will consider not only potential emergency defense demands, but requirements for rehabilitating the civilian economy in case of attack.

Goal for heavy plate, although filled, has never been closed so ODM would simply increase the tonnage to make it operative again.

POST-MORTEM: Steel Got What It Wanted

Strike cost steel producers a pretty penny . . . But they won three years of stability at reasonable cost . . . Union got a good deal, too, but less than original demands . . . Contract details—*By J. B. Delaney.*

◆ THE PRICE was high. But steel got what it went after in its latest hassle with steel labor: long-term stability at reasonable cost. It learned something else, too; that a united front is the only way to defeat the divide-and-conquer tactics of steel labor.

Dave McDonald, president of the United Steel Workers, came out of the battle with a package he could sell to the membership. It's a good package, although nowhere near his original asking price. But he had to forego the one-year contract he confidently expected at the outset. Early in the battle, he was glad to settle for the three-year pact finally agreed upon.

As predicted by THE IRON AGE before the strike (June 28, pp. 28 and 159),the three-year contract called for a package worth approximately 20¢ an hour in the first year. The union figures it at 20.3¢ an hour. According to the union's appraisal, the second-year value is 12.2¢ and the third-year, 13.1¢, or a total of 45.6¢ an hour. Steel producers probably would figure the total cost 6¢ to 7¢ higher than the union's estimate.

The Difference

The month-long strike cost steel producers approximately $250 million in out-of-pocket expenditures alone (cost of shutting down, maintenance during the strike, and starting up again). Figuring production losses at approximately 11 million ingot tons, the cost in net earnings to steel producers probably would come to about $85 million for a total of about $335 million. Steel workers suffered a wage loss of approximately $250 million.

Outstanding difference between 1956 and previous negotiations was that steel labor was forced into a defensive position almost from the start. After presenting its original demands, the union sat back to await the expected rebuttal of the producers in the form of a one-year contract offer from which it could work upward. The five-year 65¢ proposal of the 12 major producers was a stunning surprise. And their determination to stick within the framework of that offer was even more so. The steel union's consternation turned to outrage when its company-by-company poll turned up no weak links in the chain.

Once the strike started, the temper of both sides probably would have prolonged it indefinitely. But pressure from outside sources, namely the Eisenhower Administration (see opposite page), averted a bitter battle to the finish.

Here's what steel labor settled for in the showdown:

1. A three-year no-strike contract.

2. Wages: effective this year, as of contract signing, combining of job class 1 with job class 2, raising lowest-paid workers from $1.685 an hour to $1.82 an hour. Standard hourly wage increase of 7.5¢ and increases of increments between job classes from 6¢ to 6.3¢. Another wage boost of 7¢ an hour is effective July 1, 1957, and job class increments go up 0.2¢ an hour. On July 1, 1958, another wage increase of 7¢ an hour, with job class increments rising an additional 0.2¢ per hour.

A cost-of-living clause provides for adjustments each Jan. 1 and July 1 to compensate for any increases in cost of living. These increases cannot be taken away unless cost-of-living decrease at any adjustment date is equivalent to 2¢ per hour.

Continued on p. 144

Forecasting:

Iron Age Rates High

▪ The Iron Age's reputation for giving its readers advance information on steel labor developments was maintained during this year's critical negotiations.

▪ May 24, 1956: Warned that odds favored a strike if steel labor refused to slim down its demands.

▪ June 7, 1956: Established the critical strike point at around 20¢ an hour. Union settled for 20.3¢ in first year.

▪ June 14, 1956: Reiterated prediction of 20¢ settlement; warned again of better-than-even chance of a strike.

▪ June 28, 1956: Predicted three-year contract, first-year settlement of about 20¢ an hour.

▪ July 5, 1956: Advised that union would be agreeable to a three-year contract.

STAINLESS: Surprises in Market Survey

Study of warehouse shipments shows market variations . . . Some are larger, others smaller than previously supposed . . . Disclosures may prompt similar studies of other products—By *T. M. Rohan.*

◆ WHERE IS stainless steel going?

Not precisely where producers had confidently assumed it was going, nor always to the customers at whom they had beamed their advertising and sales promotion.

This surprising conclusion was reached through a study of warehouse buyers of stainless conducted by the American Iron & Steel Institute and the American Steel Warehouse Assn.

For years, steel market analysts have listed "warehouses" along with railroads, automotive, etc., as market categories in the breakdown of stainless steel shipments. This percentage of warehouse shipments was generally split up according to consumption of other indicative products to arrive at a consumption-by-industry breakdown.

Warehouse Take Grows

On this industry breakdown, stainless producers built their marketing programs and advertising campaigns. But as the percentage of stainless shipped to warehouses climbed, suspicion began to grow that something was being concealed in this ever increasing category.

Since 1946, for example, while stainless production doubled, the warehouse take tripled . . . with no real evaluation of ultimate customers. In 1955, the warehouse portion represented 28 pct of all mill shipments of stainless steel.

Results of the survey disclosed many surprises. So much so that Robert G. Welch, executive secretary of the Warehouse Assn., now expects similar surveys to be conducted on other products—cold-finished bars, for example, where warehouse participation, 23 pct, is also high.

What Survey Showed

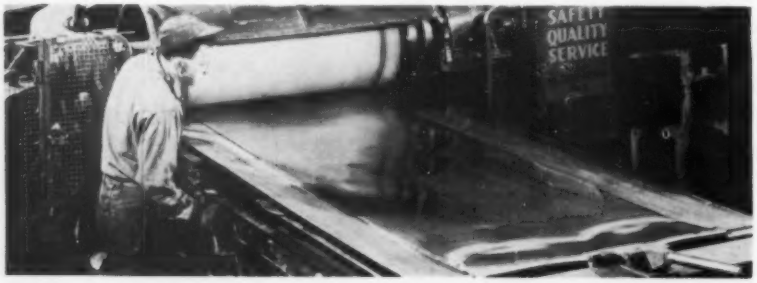
Here are some stainless facts the survey disclosed:

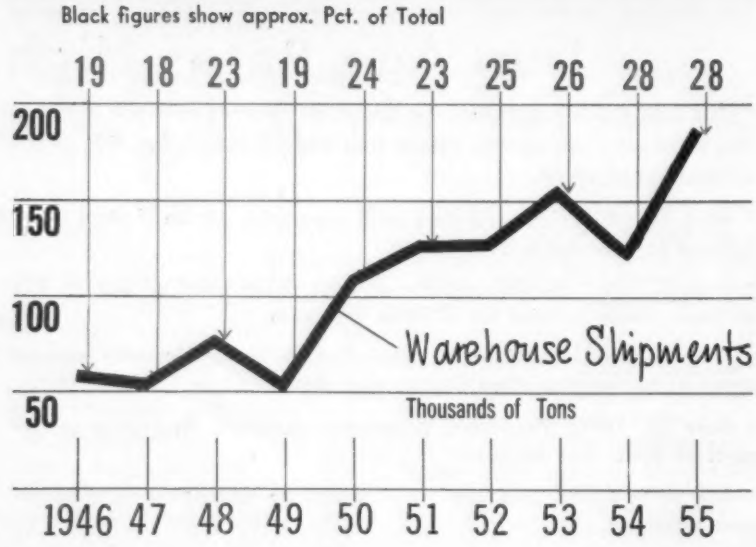
Early indications are that the aircraft market for stainless exceeds 50,000 tons a year, including mill and warehouse shipments. Market analysts generally had pegged it at no more than 40,000 tons.

Mill shipments of stainless to the aircraft industry amounted to about 7647 tons during the first quarter of this year, or 4.3 pct of total stainless shipments. Shipments from warehouses were almost as great, 5163 tons or 9.8 pct of all warehouse stainless shipments.

The chemical industry gets nearly three times as much stainless through warehouses as it does directly from mills. Mills shipped that industry 908 tons direct during the first quarter, while warehouses shipped 2449 tons. This sheds new light on the

Warehouse Stainless Take Grows




Black figures show approx. Pct. of Total
19 18 23 19 24 23 25 26 28 28
200
150
100
50
Warehouse Shipments
Thousands of Tons
1946 47 48 49 50 51 52 53 54 55

importance of the chemical industry as a market, boosts it from an estimated 0.5 pct of the total to 1.9 pct.

Some Shrink

The restaurant and commercial equipment market was known to be substantial, but the exact size was unknown because much of it is purchased through warehouses. The survey shows that 3.6 pct of all stainless shipped during the quarter went into this field. Yet direct mill shipments to this industry were only 1.2 pct of total.

Some of the obvious markets to the man on the street also shrink in contrast with total shipments. Cutlery and utensils, for example, are an insignificant percentage of total warehouse shipments. Yet mills shipped 4709 tons to this industry in the first quarter.

Productwise, the survey showed the extent of the market for sheets, which made up 57 pct of first quarter mill production. Warehouses shipped 25,714 net tons during that period, out of total mill sheet shipments of 44,841 tons.

Conversely, only 11.3 pct of mill strip shipments went to warehouses—only 7189 tons while mills shipped 36,000 tons of strip directly to the automotive industry, for example.

Using survey results, mills will direct marketing efforts to industries where their share is lagging. And they will help warehousemen on specific industries and in specific regions.

How It Was Done

In conducting the survey, IBM cards were sent out in the first quarter of the year to warehouses cooperating in the program. They represent about 50 pct of the industry tonnage. Filled out at warehouses, they indicated weight of shipment, type of stainless steel product, and to which of 31 industrial classifications it was shipped.

About 75,000 cards were returned in the first quarter to association headquarters. Breakdown by product, regions, class of customer, average size of shipment and other data were tabulated. Results are being sent to warehouses cooperating in the survey.

PRODUCTION

SCREWS: Tighter Turns Ahead

Higher capital and operating costs will reduce number of competitors in next decade . . . Modernization seen as an important goal . . . One-man ownership doomed.

◆ PROJECTED annual sales of screw machine products will reach $700 million by 1965, according to the National Screw Machine Products Assn.

With the industry's 1955 volume at $485 million, the 1965 estimate assumes even greater significance because it is based in terms of 1953 dollars.

According to the association, if prices increase at their current ratio the 1965 figure might top $800 million. These figures are based on the assumption of continued peace during the next decade, with a good-sized recession occurring.

More Output

There will be fewer screw machine products companies in existence then, but the survivors will be larger. These prognostications are based on the current death rate of smaller companies and the fact that screw machines are becoming more costly and demand more skill to operate. In addition, peacetime operation requires more output per dollar.

To substantiate its forecast, NSMPA notes that during World War II a man could set up in business for about $5000. Today, it takes about $125,000 and the returns are slower and smaller. For example, a $1 million-a-year-company nets only about $70,000 after taxes, which means profits would be eaten up if the company were to buy just five new machines.

Inspection Costs

Modernization of existing equipment is the important goal for the industry. It may be expected that the average age of screw machines by 1965 will be less than half of today's average. In 1954, 56 pct were 10 or more years old.

Electronic inspection will take over from the human element. This is particularly significant because inspection has always been a costly area for screw machine products firms where rejects have averaged 2 to 3 pct of sales. And there will be more automation and better material handling.

On the subject of costs and wages, competition within the industry is expected to grow keener as the weeding-out process continues. This will lead to more incentive and profit sharing plans.

Organization Changes

And there will be more in-plant training plus a wider gap between skilled and unskilled pay rates. Hourly wages and salaries of employees will increase 25 pct. While there will not be any appreciable increases in executives' take home pay, the association says, this will be offset by executive bonuses, stock options and deferred payment plans.

Leading firms 10 years from now won't be owned and operated by one or two men. Instead, the trend will be toward more paid managers, more companies with their own engineering staffs.

Less Captivity

Many independent producers—now playing the role of "captive shops"—should be in a more favorable position 10 years from now. This is attributed to the probability that the Guaranteed Annual Wage will drive a lot of captive work into the open market.

By 1965, many major screw machine products manufacturers will become semi-captive, with perhaps 30 to 50 pct of their business coming from a few large customers.

BUSINESS

GALVANIZED: Don't Run for Cover

Midwest rumors of a shortage are not well-founded . . . Near record production despite strike loss should keep users happy . . . Grain bin orders are big, but not enough to cause panic this year—By *K. W. Bennett.*

◆ IT MAY BE CLOSE, but galvanized users should have good supplies in the post strike period.

Rumors of a fourth quarter shortage have been strong in the Midwest. Admittedly, there's a reason to watch galvanized. In the past two weeks a sprinkling of mammoth size warehouse orders were received. At the same time, the U. S. Dept. of Agriculture let contracts for another grain bin program, somthing that always has at least a psychological effect among other galvanized users.

Shipments Climb

Steel market experts pointed to the monthly average production figures, which indicated that the monthly average of galvanized shipped was continuing to climb in the months before the strike while total steel monthly average deliveries were falling. And when one producer announced that galvanized quotas for the fourth quarter were to be reduced, there were a few instances of mild panic among galvanized buyers.

But closer examination of the facts suggests that while galvanized will enjoy a post-strike surge. will probably reach a figure of 2,800,000 net tons shipped this year despite the strike, users will not suffer the struggle for materials that followed the 1952 strike period.

Good Inventories

Warehouses, for instance, entered the strike period with inventories of galvanized sufficient for five-six months of normal deliveries. This can be regarded as a fairly high figure, since optimum warehouse stocks of popular items most commonly center around four months. Similarly, the big users of galvanized who use coil stock rather than the cut sheet more commonly marketed by warehouses, had beefed inventories considerably in the 60 days prior to the beginning of the strike, when galvanized sheet deliveries became current and some selling pressure was necesary to move the material at the high levels enjoyed in the first quarter 1956.

Grain Bins in Stride

Nor will the second wave of grain-bin lettings boost demand for galvanized sheet heavily. Earlier this year a letting of 30,765 bins (100,000,000 bu. storage capacity) boosted galvanized temporarily, but the recent July letting is for 2,761 bins (about 9,000,000 bu. storage capacity) and it is generally conceded that the steel for these bins is already in stock or immediately available.

The combination of high shipments in first half, coupled with minor declines in a few of the industries served by galvanized producers suggest capacity operations through the remainder of this year, but not the mill carryovers as in 1955.

Steel Taxes Ride Escalator Too

◆ A WAVE of assessment hikes hit Chicago area steel mills as plants of U. S. Steel, Youngstown Sheet & Tube, and Inland Steel Company all received notification from the Lake County, Ind., board of tax review, of substantial increases in personal property assessments.

The schedule revisions began three weeks ago, when the U. S. Steel Corp.'s Gary properties were re-evaluated from $64,700,000 to $250,000,000. More recently, Inland's assessment on personal property was moved to $107,738,495 and the Youngstown personal property went to $54,822,770.

In both of the latter cases, the tax board set aside the evaluation set on the properties by the township assessor, as his recommendations affected personal property holdings of the two companies. Real estate and building evaluations were allowed to stand, and these are not included in any of the above valuations.

While Lake County chairman of the review board indicated that the moves were planned to equalize tax rates among steel mills in the area, a statement by one board member suggested that property taxes may be beginning to "escalate" in the manner of wages, raw material costs, and equipment costs.

The board member had recommended a $120,000,000 assessment for Inland and $64,000,000 for Youngstown. His argument: replacement value of a steel plant in 1949 was estimated at $200 per ton of capacity, hence present output levels would make the mill properties worth $1,000,000,000 in the case of Inland, and $540,000,000 for Youngstown. From this point on, the sky is the limit.

SECURITIES: Rubles In U.S. Industry?

Discovery that billions of dollars are invested in Wall St. by unknown foreign interests touches off a series of probes . . . Senate concerned over possible Red financial infiltration—*By N. R. Regeimbal.*

◆ EASE with which foreign interests, including Communists, can secretly invest in American industries and possibly gain control of defense contractors, is touching off a flurry of worry and investigations by the federal government.

There are strong indications that Congress next year may be asked to close "handfuls" of loopholes to prevent such secret investments and protect U. S. investors and defense secrets.

Thus far, nobody blames anybody for the possibility that unfriendly interests may own huge blocks of vitally important firms. Nobody is even sure they do—they can't find out, and that is what's causing the worry.

Began In 1950

A special Senate internal security investigating subcommittee is now looking into the problem. So is the Securities and Exchange Commission, the Pentagon, and later, a Senate banking subcommittee will join the search.

SEC financial experts say untold billions of dollars began entering this country in about 1950. It has since disappeared. The money, they say, flowed in mostly from Canada, Switzerland, Mexico, and some South American countries. That's all they know. They don't know, in most instances, who controls these huge lumps of money or even where it came from originally.

For instance, in 1950, about $1 billion was transferred out of France and Italy into Uruguay. Uruguay was unable to absorb it all, so it was transferred into Mexico and then this country.

Investigators have found some $13.8 billion that has flowed into this country, and believe that is only a small portion of the whole. In a few cases, they know it was invested in U. S. industry, but they don't know who owns it.

Money coming from foreign sources is deposited by numbers, not by name. In each movement, the owner's identity is hidden by numbered accounts, and each transfer is by number.

The Senate Security subcommittee is concerned over the potential danger of a Red infiltration into American industry by use of Russia's vast gold reserves to buy control of defense contracting firms.

There is an indication, according to government sleuths, that there may be members of the U. S. Communist party working for big investment houses whose job it is to pinpoint vital production firms and direct Red efforts to buy control of them. It is also possible, officials say, that American citizens have been employed as directors in companies without knowing they are actually controlled by foreigners operating through brokerage firms, banks, or phony names.

Nothing To Hide

The fault isn't industry's. Business firms have no way of uncovering ownership of hidden bank accounts which might be used to finance an interest in a firm. Neither does the Pentagon.

A Defense Department spokesman recently urged Congress to require full disclosure of the identity of foreign investors in American firms, or prohibit such investments. If foreign investors have nothing to hide, they won't mind being identified, backers of this plan say. It is sure to raise a storm in financial circles.

Case of the Missing Coupon Clippers

Federal agencies concerned with investments have a sleuthing job cut out for them. The mystery:

Who owns foreign capital invested here under protection of numbered bank accounts and numbered transfers?

Foreign banks, particularly in Switzerland, refuse to disclose the holders of the accounts.

A Senate internal security subcommittee will hold hearings this month, calling—among others—more than a score of U. S. business men to discuss foreign ownership of defense industries.

A Senate banking subcommittee will open a similar staff study in a few days.

By next year, the subcommittees, working with the Securities and Exchange Commission, will probably come up with legislative recommendations forcing disclosure of foreign investors.

HIGHWAYS: What Big Program Requires

Construction programs will eat up 49 million tons of steel in next 13 years . . . Planned highways, both federal and local, will also require 442,000 men at peak of program . . . Steel requirements projected.

◆ HIGHWAY CONSTRUCTION in the next 13 years will require at least 49 million tons of steel and at the peak of the program will employ 442,000 men directly on highway construction jobs.

And according to year-by-year estimates of the Bureau of Public Roads, the program will require 1399 million barrels of cement, 128 million tons of bituminous material and 9710 million tons of aggregate.

These figures for 1957 through 1969 represent estimated requirements for all highway construction. This includes not only the $32.9 billion program authorized by the Federal-Aid Highway Act of 1956 and funds remaining from previous authorizations, but also the additional Federal-aid work contemplated to be authorized by future legislation, together with State, county, municipal and other highway construction expected to be performed without assistance.

The total financing of highway construction, other than Federal funds, is based on the premise that the expenditure will continue at about the 1956 level for each ensuing year.

Usage Will Vary

The material quantities shown in the tabulation (see table) are a reflection of material usage factors developed from data reported by contractors, adjusted to the price level of current expenditures and are expressed in units of the various items of material per million dollars of construction expenditure.

These factors vary somewhat from year to year. For example, if in one year there is a nationwide predominance of large bridge construction, the structural steel usage factor for that year will be high, whereas if surfacing predominates the cement, asphalt and aggregate factors will become more significant.

In an analysis of material usage factor trends and averages covering the past several years, it was found generally that the 1955 factor was about average. In some cases, where there was an upward or downward trend, the 1955 factor was the latest point on the trend and was used.

Increased productivity in the highway construction field during the past 11 years has reduced by 43 pct the man-hours of labor required for a given construction volume. The labor usage factors upon which the labor requirements are based are expressed in terms of man-hours per million dollars construction cost and adjusted to the current price level. The factors are a projection of the downward trend which indicates the increased productivity. The requirements, shown in terms of workers, were converted from the man-hour figures on the basis of the average worker being employed 1600 hours per year due to seasonal and weather conditions.

Estimated Material and Labor Requirements for an Expanded Highway Program

Calendar Year	Units	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	Total 1957-1969
Structural Steel	Thousand tons																
Wide Flange Shapes		444	663	809	880	918	944	944	944	944	944	944	944	944	866	814	11,839
Standard Shapes		211	303	370	402	419	431	431	431	431	431	431	431	431	395	371	5,405
Bearing Piles		96	144	176	191	200	205	205	205	205	205	205	205	205	188	177	2,572
Sheet Piles		39	43	53	58	60	62	62	62	62	62	62	62	62	56	53	776
Wide Plates		58	87	106	115	120	123	123	123	123	123	123	123	123	113	106	1,544
Standard Plates		135	202	246	268	279	287	287	287	287	287	287	287	287	264	248	3,601
Subtotal		983	1,442	1,760	1,914	1,996	2,052	2,052	2,052	2,052	2,052	2,052	2,052	2,052	1,882	1,769	25,737
Reinforcing Steel (1)	Thousand tons																
Bar		589	745	909	989	1,030	1,060	1,060	1,060	1,060	1,060	1,060	1,060	1,060	972	914	13,294
Wire		118	186	227	247	258	265	265	265	265	265	265	265	265	243	228	3,323
Subtotal		807	931	1,136	1,236	1,288	1,325	1,325	1,325	1,325	1,325	1,325	1,325	2,325	1,215	1,142	16,617
Corrugated Metal Pipe	Thousand tons	148	165	201	219	228	234	234	234	235	234	234	234	234	215	202	2,938
Other Misc. Steel (2)	Thousand tons	147	182	235	256	267	274	275	275	275	275	275	275	274	252	237	3,445
Total Steel	Thousand tons	2,085	2,720	3,332	3,625	3,779	3,885	3,886	3,886	3,887	3,886	3,886	3,886	3,885	3,564	3,350	48,737
Labor (3)	Thousand workers	323	365	424	442	443	441	426	414	398	394	384	370	354	326	302	—

(1)—Does not include reinforcement in concrete culvert pipe.
(2)—Includes steel guard rail, fences, cast iron pipe, pavement joint devices, tubular piling, nails, etc.
(3)—On-site requirements assuming 1,600 man-hours per year per worker.

HOW TO SIMPLIFY PRESSING OPERATIONS

...assembling – riveting – marking – trimming – broaching – punching

PREVENTS BREAKAGE of plastic units in riveting of metal inserts.

ELIMINATES SCRAP in assembly of bearings at rates of 200 to 300 per hour.

SPEEDS ASSEMBLY of brass cone to steel stem... 800 to 900 per hour.

easily tooled for any pressing job

DENISON 1-ton hydraulic *MULTIPRESS*®

now gives you:

More production per hour with extremely fast cycle time . . . without kicking pedals or pulling levers.

Uniform quality production with accurately duplicated ram pressure on every stroke.

Maximum safety with interlocking controls to prevent accidental tripping.

THE
DENISON ENGINEERING COMPANY
1242 Dublin Road Columbus 16, Ohio
A Subsidiary of American Brake Shoe Co.

DENISON *HydrOILics*

HYDRAULIC PRESSES • PUMPS • MOTORS • CONTROLS

MAIL DATA FORM
to see how you can benefit

THE DENISON ENGINEERING COMPANY
1242 Dublin Road, Columbus 16, Ohio

MY APPLICATION

Type of Operation	*Type of Material*
☐ Assembling	☐ Steel
☐ Marking	☐ Brass
☐ Punching	☐ Aluminum
☐ Trimming	☐ Plastic
☐ Broaching	☐ Glass

☐ Have Salesman Call

Company Name _____
Address _____
City _____ *Zone* ___ *State* _____
Your Name _____
Position _____

EXPANSION IN INDUSTRY

Purchase:

Acme buys Newport for undisclosed price.

Acme Steel Co., Chicago, will purchase Newport Steel Corporation, a Merritt-Chapman & Scott subsidiary. The two companies represent, on the basis of present operations, an annual sales total of $170,000,000. THE IRON AGE 1955 financial Analysis lists Newport as having $22,891,455 in invested capital; $8,572,052 in working capital; and a $21,825,964 surplus. Price has not been announced.

Acme produces cold rolled strip, steel strapping, stitching wire and machines, floor plate, specialty structural material; and in specialized divisions produces steel kitchen cabinets, tubular metal furniture, and has a woodworking operation that produces core plywood.

Acquisition of Newport, besides making hot metal facilities part of the Acme organization, will add hot and cold rolled sheets, electric weld line pipe to the Acme product line. Newport is currently rated, in a statement made last week, at 600,000 net tons of open hearth and electric furnace steel, along with related blooming and finishing facilities. The mill has produced galvanized sheets and electrical sheets, and in 1954 was rated by the AISI as having 708,500 net tons of ingot capacity at the Kentucky works.

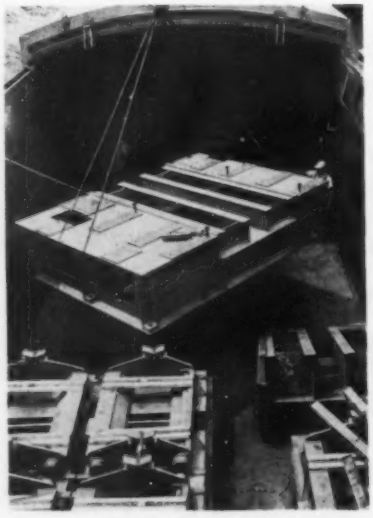
Acme has indicated that it will barge at least some semi-finished steel from Newport to its rolling mill at Riverdale, Ill.

Merritt-Chapman & Scott owned about 98 pct of the Newport stock. The sale to Acme marks the fourth property disposed of by M-C & S in the past year. Among others was Nesco division of New York Shipbuilding Corporation, Shoup Voting Machine, and Utah Radio Products.

Rolling Down the River

◆ EIGHT new rolling mills will come "barging" in to the Davenport, Ia. works of Aluminum Co. of America. The equipment, built for Alcoa by United Engineering and Foundry Co., is being shipped on standard barges from the Allegheny River Terminal, Pittsburgh, 1460 miles along the Ohio and Mississippi Rivers.

Bed plate for one of the two foil rolling mills which make up the first shipment is being hoisted to its position on the barge. Entire load will be 300 tons. The equipment carrying barges will berth at Davenport 16 days after their departure from Pittsburgh via the inland water route.



A Correction—

The editors regret the implication in a June 7 article, "Red Bloc Divides Export Markets," which implied that Austria was a member of the Red bloc.

While part of eastern Austria was at one time occupied by Soviet troops, the country is now entirely independent of the Soviet Union and aligns itself with the Western powers.

Expansion Briefs

Kaiser Aluminum & Chemical Corp., Oakland, Calif.; to increase capacity of Newark, O., plant for turning out aluminum rod, bar, wire and electrical conductor, by 23,500 tons annually; cost about $5.5 million.

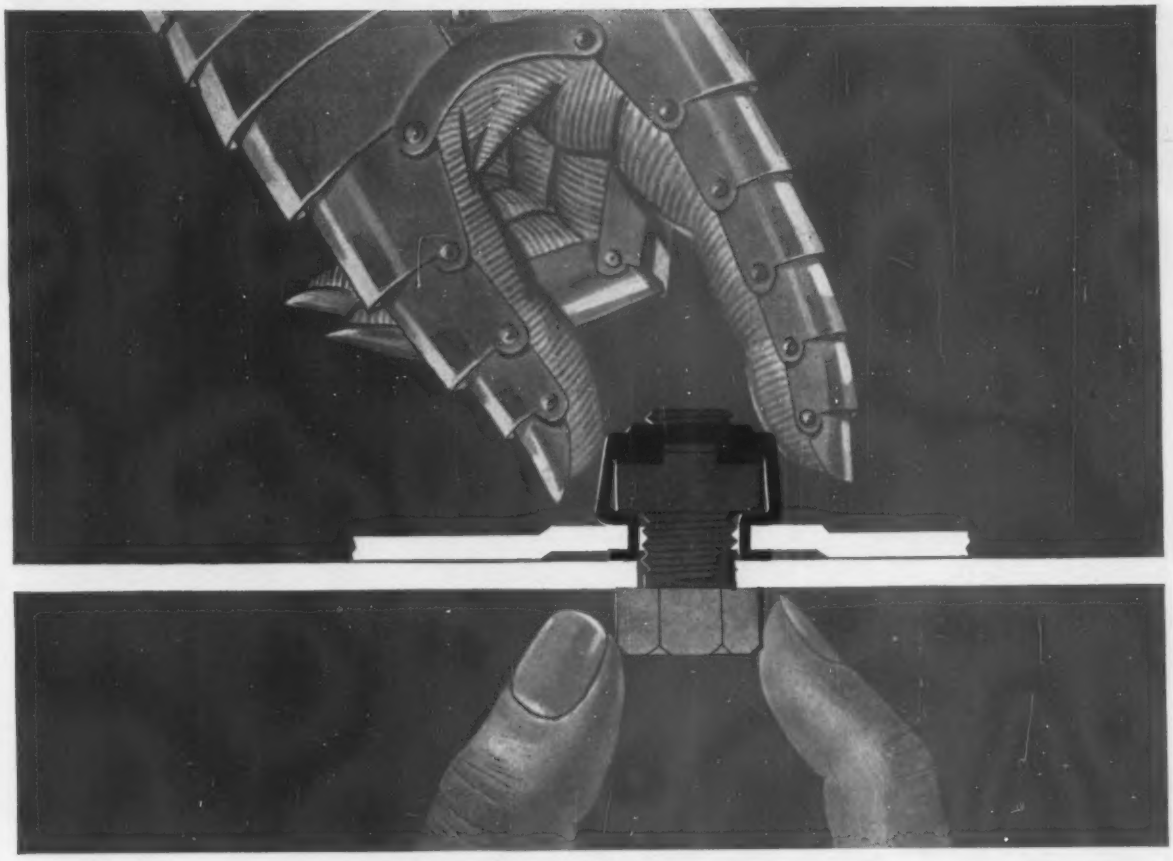
Alan Wood Steel Co., Penco Metal Products Div.; new plant to be constructed by Robert E. Lamb & Son in Oaks, Pa.; cost $2 million.

Marchant Calculators, Inc.; building new headquarters and factory in Oakland, Calif.; cost about $4 million.

Dresser Manufacturing Div., Dresser Industries, Inc.; new multi-million dollar plant in Wellsboro, Pa.; completion expected early 1957; will turn out couplings and pipe fittings.

Aerobilt Bodies, Inc., truck body manufacturing subsidiary of Grumman Aircraft Engineering Corp., West Athens, N. Y.; 30,000 sq ft plant extension; will double truck body capacity.

Rockwell Manufacturing Co., Pittsburgh; will build a new valve manufacturing plant, Kearney, Neb.; cost about $2 million.



FINGERS OF STEEL
that hold where you can't reach

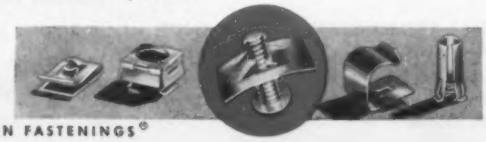
If you can't reach the back of a panel to hold a nut, let the spring steel fingers of a Tinnerman SPEED GRIP® Nut Retainer hold it for you. No welding or staking, no special skills or equipment required. It's the most efficient way to attach a square nut to a panel in blind location.

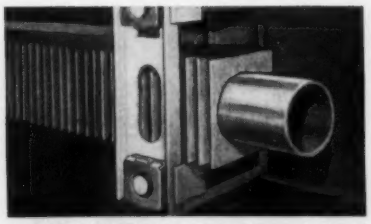
The SPEED GRIP combines a square nut retained in a spring steel cage. The SPEED GRIP snaps easily into the panel. Expensive rigid position methods are eliminated. Nut floats free in the cage to offset minor hole misalignments, but cannot turn as bolt is tightened.

SPEED GRIPS can be put on anywhere along your assembly line . . . no side trips to special stations, no line deviations of any kind. Rustproofed, they can be applied after painting, ending costly masking or retapping of paint-clogged threads.

Consult your Tinnerman representative soon and write for Bulletin No. 335. **Tinnerman Products, Inc., Box 6688, Department 12, Cleveland 1, Ohio.**

TINNERMAN
Speed Nuts
FASTEST THING IN FASTENINGS®

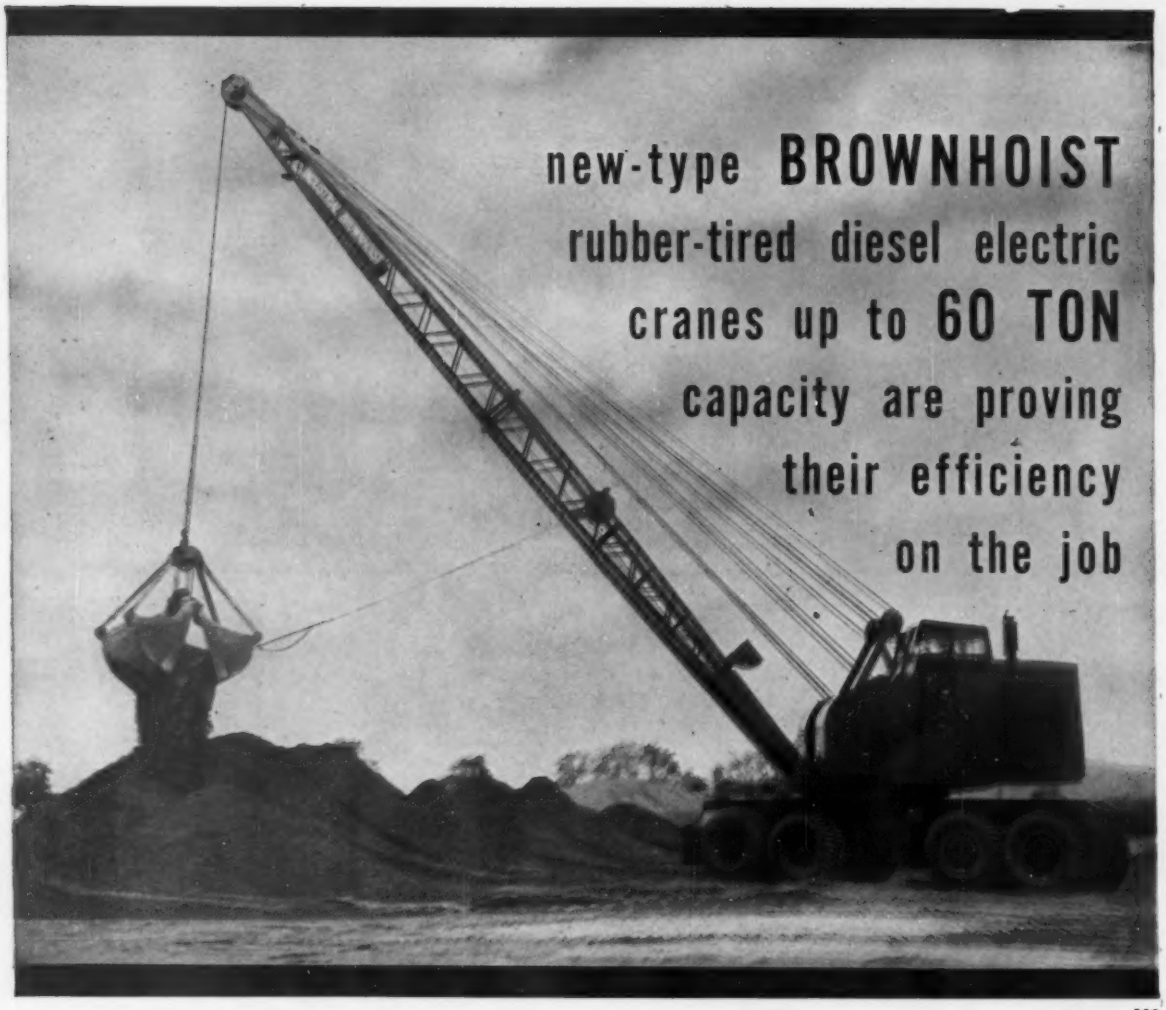




SPEED GRIPS eliminate several punched and tapped holes, cut assembly costs 78%, simplify installation of heater.

SPEED GRIPS applied *after* painting simplify blind-location assembly of auto seat handle, avoid paint-clogging of threads.

SPEED GRIPS cut costs 75% by replacing tapped holes and weld-type nuts as mounting fasteners on car radio.



183

BROWNHOIST MATERIAL HANDLING EQUIPMENT GIVES A LIFT TO AMERICAN INDUSTRY

INDUSTRIAL BROWNHOIST CORPORATION
BAY CITY, MICHIGAN • DISTRICT OFFICES: New York, Philadelphia, Cleveland, Chicago, Denver, San Francisco, Montreal • AGENCIES: Detroit, Birmingham, Houston

The new Brownhoist Wagon-Cranes are specifically designed to do an outstanding job wherever high mobility and high capacity are required. You'll see them at work performing heavy duty jobs in mines, quarries, steel mills, for railroad and lumber operations and for many other large industries. Equipped with dynamatic clutch, anti-friction bearings at all essential points, power steering, electric travel and electric rotation. Mounted on a 12 wheel crane carrier capable of speeds up to 8 miles per hour, the unit can be operated by one man from easy-to-reach controls. Economical to operate. Available in capacities from 25 to 60 tons. For specification folder or further details, get in touch with our nearest representative or write us at Bay City.

SUBSIDIARY OF Penn-Texas

BROWNHOIST

REPORT TO MANAGEMENT

It Still Looks Good

There's a good chance that the steel strike will have no lasting effect on the general economy this year. Business in general will pick up where it left off, or slackened, and continue at its merry pace through the rest of the year.

This is not to minimize its effects. They were more serious than the public appears to realize. When new schools don't open as scheduled next September, and perhaps your children are put on half days, you'll begin to realize that in these days of a racing economy, lost steel production isn't made up over night.

But the areas where business was hardest hit (construction, oil drilling, railroad cars, etc.) are not those that the general public is immediately concerned with. The effects there are not directly felt, unless you are a supplier or contractor.

Chances are, the country will come out of the strike in the same spending mood, backed by excellent earnings, that characterized the first half of the year.

If You Had Any Doubts—

The first six months showed an economy operating at a record rate. The Dept. of Commerce reports the rate was well in excess of the same period of 1955, in spite of the slowdown in automotive and home building.

Consumer spending in that period was at a record rate too, supporting the general high level of business activity. If this is resumed with the end of the steel strike, the second half will continue at that rate, or possibly better.

Where Will the Push Come From?

You should be aware that most of the auto producers are about to close out the production of their 1956 lines which never really caught the public's fancy.

But this will be changed when the re-styled, re-engineered 1957 cars hit the market. (See Automotive Assembly Line, p. 60.) There is little doubt but that auto buying will be resumed and that the anemic auto production and employment figures of 1956 again will resemble the fat figures of 1955.

There is no indication that the remainder of the economy will falter in any way. With automotive production back in high gear, the rest of 1956 looks good.

No Easy Way To Train Engineers

Congress, some government officials and educators, are leaning toward federal and state subsidization as the only means of solving the shortage of engineers, scientists and technicians.

A special Senate subcommittee now recommends aid to universities in training scientists, widespread federal scholarships, creation of a national reserve of scientists in private industry available as teachers, and expansion of reactor training programs in the field of atomic energy.

It's universally accepted that the critical shortage of scientific manpower is endangering this country. But educators also warn against "short sighted" measures which would remedy some shortages, but create more serious imbalances elsewhere.

Meanwhile, starting salaries of engineers continue to climb, as you have no doubt noticed if you tried to hire any of this year's educational crop for your firm.

Salaries of 1956 graduates at Illinois Institute of Technology, for example, averaged $391 a month, compared with $383 last year. In 1949 the average was $282. For the record, electrical engineers started at $461.

INDUSTRIAL BRIEFS

Are Secretaries Obsolete? . . . An addressograph machine that will write a complete letter from blank paper in one run has been developed by the Addressograph Multigraph Corp. of Cleveland. The machine, Addressograph Model 1938, will print and personally identify a reply card. It will also print a return address and postal indicia simultaneously with the addressing of the envelope.

How To Win Friends . . . James A. Rowan & Associates now have offices in Pittsburgh, New York and Princeton, N. J., for counselling services to industry in plant community relations, employee communications, and community attitude surveys.

Good Return . . . A $10 million credit by the Export-Import Bank of Washington to finance the sale of U. S. equipment for a steel mill in Germany has been authorized to August Huette, A. G. This is the first major credit by the Export-Import bank to a borrower in Germany. The loan will enable the German company to purchase, in the U. S., machinery to produce semi-finished steel, light structural shapes, tinplate and galvanized sheets.

It Takes Two . . . Swift Electric Welder Co. and the Ohio Machine Tool Co. have merged into the Swift-Ohio Corp. in order to bring new ideas, techniques, better service in multiple operation equipment for materials handling, welding, machining, and assembly.

Desirable Inflation . . . Worcester Pressed Steel Co. has been awarded a U. S. Navy contract for more than a quarter-million new-type, one piece pressurized cylinders to inflate life jackets. Value of the contract is $209,851.

Home Away from Home . . . United States Steel Homes, Inc., is going abroad with an exhibition house. The company, subsidiary of U. S. Steel Corp., shipped the structure from New York to the International Trade Fair at Zagreb, Yugoslavia, Sept. 7-21, 1956. The home will be exhibited at the Balkan fair, with other American displays, by the U. S. Dept. of Commerce.

Summer School . . . Engineering seminars will be established as part of the customer training program currently offered by GE's Metallurgical Products Dept. (formerly Carboloy), Detroit. The seminars will be of conference type dealing with advance design and application of all metallurgical products, including carbides. It will cover subjects regarding machinery and the Carboloy machinability computer.

"It's agreed then, the quickest way to empty the plant, in an emergency, is to yell—coffee break."

Deep in the Heart of . . . Michigan Seamless Tube Co., South Lyon, Mich., has organized a subsidiary to own and operate a plant in Rosenberg, Tex. The new subsidiary, Gulf States Tube Corp., will manufacture seamless steel tubing and seamless steel pipe for the oil, chemical, agriculture, automotive, aircraft and other industries.

Southern Hospitality . . . The J. M. Tull Metal & Supply Co., Atlanta, Ga., has purchased a four-acre site in Birmingham, Ala., to build a warehouse with 40,000 sq ft of floor space for distribution of nickel, stainless steel, hot and cold-finished steel, aluminum, copper and brass.

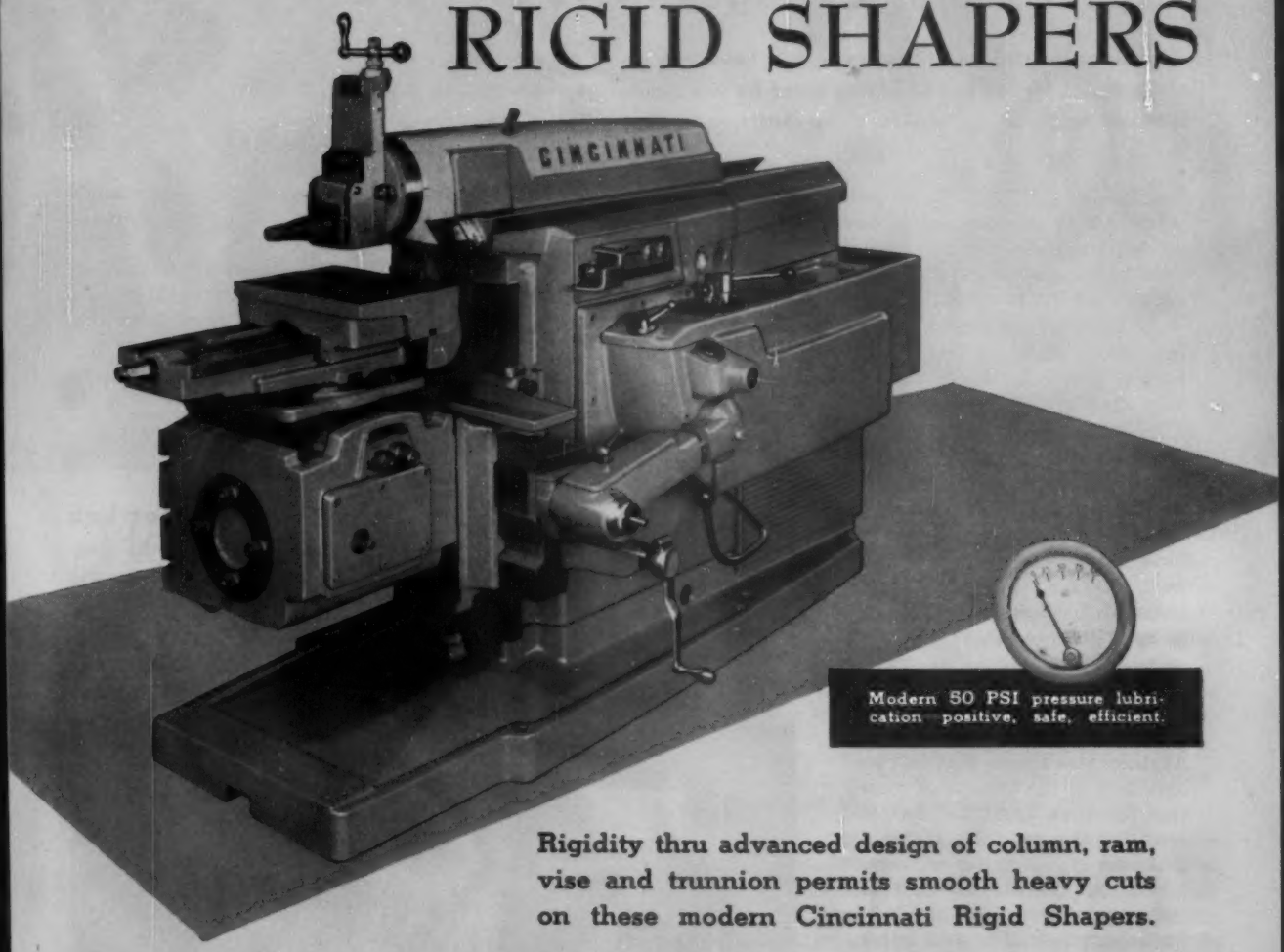
First Enlistment . . . The Truck-Man Div. of The Knickerbocker Co. has joined The Material Handling Institute, Inc. As a manufacturer of gasoline powered fork lift trucks, the Michigan firm will be active in the Industrial Gas Truck Product Section of the Institute.

Research and Honors . . . The nuclear research laboratory of General Atomic Div. of General Dynamics Corp. was named the John Jay Hopkins Laboratory For Pure And Applied Science during the dedication ceremonies held at the division's temporary quarters.

The Deep Six . . . A radio transmitting buoy has been developed by Servo Corp. of America, New York. Within minutes after a submarine hits bottom, rescue stations can receive the distress signal, "SOS SUB SUNK SOS." The transmitter locates the exact position of the distressed craft and transmits the signal over a radius of 60 miles and is not affected by unfavorable weather conditions.

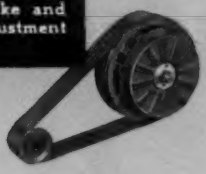
Modern nodular iron slot-free ram for greater accuracy.

CINCINNATI RIGID SHAPERS



Modern 50 PSI pressure lubrication—positive, safe, efficient.

Modern brushless electro-magnetic brake and clutch—no adjustment required.



Rigidity thru advanced design of column, ram, vise and trunnion permits smooth heavy cuts on these modern Cincinnati Rigid Shapers.

The most modern controls and oiling system give speedy performance and easy and positive operator control.

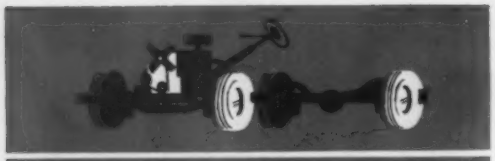
Furnished in 16″ to 36″ capacities.

WRITE FOR THE NEW DESCRIPTIVE BULLETIN.

CINCINNATI

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES



Expect Major Changes In 1957 Cars

They'll be longer, lower and most will have important engineering changes . . . More than $1 billion spent by the industry for revamping models is bound to show . . . Brakes, drive shafts revised—*By T. L. Carry.*

◆ THIS IS THE TIME of year when just about every automotive writer in the business gets out his two-headed coin and starts to tell the public what to expect.

So far, the consensus is that the 1957 models are going to be longer, lower and wider and will have more glass than ever before.

No one is in a position to say just how the cars are going to look or what specific improvements they will have. The reason being that the fortunate few who have been able to see some of next year's cars are practically bound by oath sealed in blood not to mention what they have seen.

Heavy Spending . . . But it is widely conceded that 1957 is the year for a major change in cars. Anybody who doubts that fact need only look at the amount of money that has been spent for dies and retooling this year. Estimates are that over $1 billion has been spent to change the cars around and make them more appealing to the motoring public.

You simply can't spend that much money and come up with an evolutionary change, as has been rumored in some circles.

A major amount of the tooling money has gone into engineering changes. It is unfortunate that this type of change cannot always be seen but often adds a great deal more to a car's value than its mere physical appearance.

Stop and Step Easier . . . Some that are due in 1957 are major changes in braking systems. Perhaps all cars will not be equipped with a different type of brake but some, mostly the more expensive models, are due for a form of disc brake.

In addition, you can expect to step down into more than one of the 1957 cars. There is a definite reason for this type of design. In an effort to lower a car's silhouette, engineers found that they had reached the practical limits as far as the drive shaft is concerned.

They have managed to get around this to some extent by using a frame that is above the floor pan of the car. At the same time, they have cut the drive shaft into three sections so that it won't interfere with ordinary driving and will help eliminate the tunnel that runs along the middle of the floor pan.

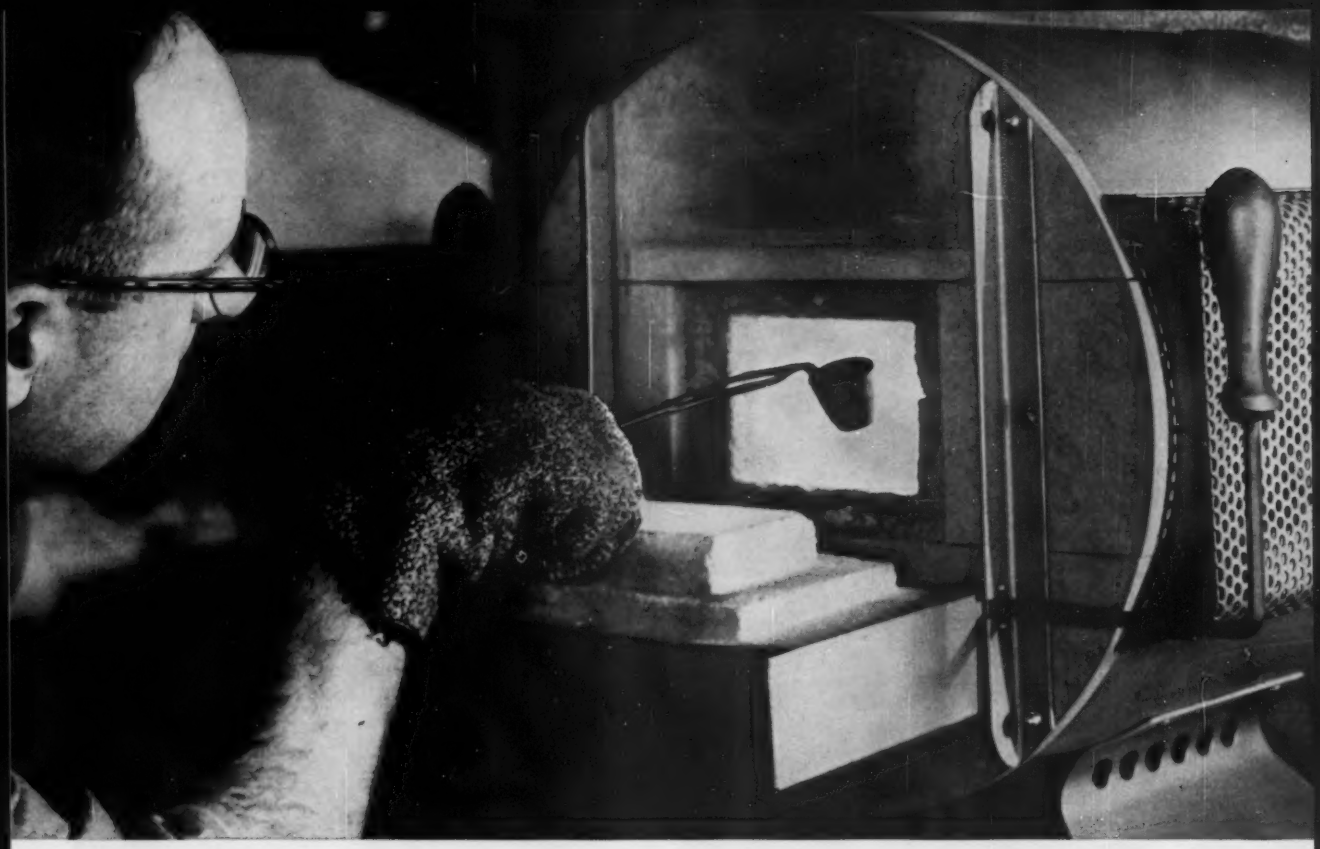
These changes, although they might affect the appearance of a car, are not readily noticeable to the public. But the fact remains that they are major changes and have cost just as much or a lot more money than basic body and trim changes.

New Carburetor Lab

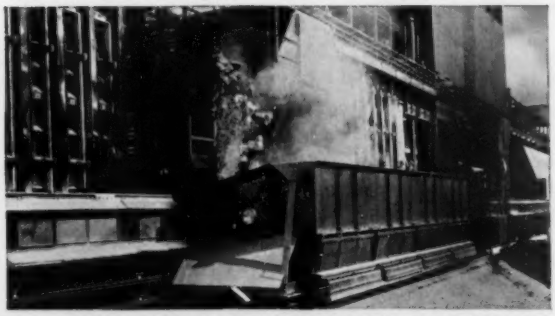
Ford Motor Co. has just completed a laboratory for testing carburetors at its research and engineering center in nearby Dearborn.

Tests are conducted in five spe-

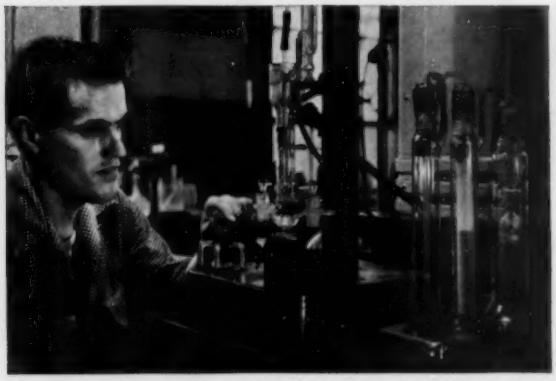
ADJUSTING A CARBURETOR shouldn't be much of a task for this Ford engineer, except that the enclosure he is in simulates an altitude of 10,000 ft. It's all part of Ford's new fuel and air-flow lab at Dearborn, Mich.



How Great Lakes Steel *blends* quality



COKE OVENS eject tons of flaming, quality controlled coke into cars for rapid delivery to quencher. Then . . .



SAMPLES ARE ANALYZED carefully to determine the amount of sulphur in the coke used in the blast furnaces.

Take five kinds of carefully selected soft coal. Blend well. Bake in a 2500° oven for 15½ hours. And if every step has been checked and double checked, the way it is at Great Lakes Steel, *presto!* You get pure, hard coke—the vital ingredient for reducing ore to high-quality pig iron.

Above, you see Great Lakes special coke recipe (cut in millionths, of course) being checked for ash impurities, a very important step in the complete analysis.

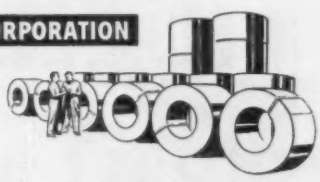
First, a sample of each kind of coal is burned to a cinder in the test furnace. Then the painstakingly mixed blend gets this dress rehearsal heat treatment, too. And this makes doubly sure that the blast furnaces produce quality iron . . . iron to make steel that meets customer specifications *to the letter!*

Quality control from raw materials to finished product—that's Great Lakes Steel! May we help you?

GREAT LAKES STEEL CORPORATION

Ecorse, Detroit 29, Michigan • A Unit of

NATIONAL STEEL CORPORATION



District Sales Offices: Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.

NUMBER 1 OF A SERIES

PRODUCTION SHORT CUTS WITH

ZINC

DIE CASTINGS

The RAMBLER puts on its best front!

The completely new 1956 Rambler—by American Motors—features a unique front end assembly styled to endow this compact, economical car with a massive, forward-thrusting look. And this assembly graphically illustrates why ZINC Die Castings are so widely specified by design engineers in and out of the automotive industry.

As you see, the ZINC Die Cast grille is attached to a sheet metal frame before mounting on the car. The grille top molding and the inboard headlamp bezels are then attached to cover the frame and complete the front end. Because such unusual shapes can be die cast, only four castings are required in the assembly (plus the two running-light bezels in the fenders).

Send for your copy

The Rambler front end assembly is further simplified by casting the steel mounting bolts as inserts in the back of both the grille and the molding. These precisely located fastening elements, plus the overall dimensional accuracy of the castings, assure perfect fits every time. Add easy finishability (all of the castings are beautifully chromium plated) and you have the principal reasons why ZINC Die Castings are specified by American Motors engineers.

For possible answers to *your* particular production problems, send for our brochure and contact any commercial die casting company.

The New Jersey Zinc Company, 160 Front St., New York 38, N. Y.

ZINC
FOR DIE CASTING ALLOYS

The Research was done, the Alloys were developed, and most Die Castings are based on

HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
JULY 28, 1956	121,563	23,553
JULY 21, 1956	122,729	24,219
JULY 30, 1955	171,465	28,295
JULY 23, 1955	178,784	29,629

*Estimated. Source: *Ward's Reports*

cial rooms in the laboratory where car travel conditions ranging from sea level to an altitude of 10,000 ft can be simulated.

In addition to facilities for testing the flow of fuel and air in an engine, work on fuel injection also will be conducted at the site. Tests are also being made on manifolds, air cleaners and other components in auto induction systems.

Earle S. MacPherson, head of Ford Engineering, says the stepped up research is in keeping with the trend toward greater performance in today's engines and the more efficient burning of fuel.

NEW FORD:

Fifth line to be added next year.

Ford Motor Co. is paving the way gradually for the introduction of its E car some time in 1957. Latest development is the consolidation of the Lincoln and Continental Divs. under the leadership of Ben D. Mills, Ford vice president and general manager of the new division.

The consolidated group will be known as the Lincoln Div. And Ford says it will serve to advance the company's position in the fine car field.

In addition, the division has announced plans to divorce itself in a sales move from the Mercury Div. which is currently handling all Lincoln sales.

The new division plans to establish an exclusive field organization. This will entail establishment of district and zone sales offices and ultimately the awarding of separate dealer franchises.

The reorganization has not reached this point yet but it is hoped that the new plan will be partially in effect by the time the 1957 models are introduced.

The time is not far off when Ford's Special Products Div. will be announcing its new car and the company is trying to make room in its organizational setup for an orderly introduction.

Perhaps this is the reason that William Clay Ford, formerly group director of the Lincoln and Continental Divs., has turned his duties over to Mr. Mills. It is possible that young Mr. Ford will head up the new car division.

Greyhound Nips GM

General Motors Corp. appears to be catching it from all sides this year.

Right on the heels of a government antitrust suit charging GM with a bus monopoly comes word that Greyhound Corp. is preparing to file a multi-million dollar damage suit against the firm.

Arthur S. Genet, president of Greyhound, says the company purchased 1000 Scenicruiser buses from GM for an estimated $53 million. According to Mr. Genet, 570 of the buses were not up to the mechanical standards of Greyhound or the production standards of GM.

No Satisfaction

Specifically, he says the trouble is located in the lubrication systems for automatic transmissions and clutches.

According to Greyhound, the suit is being prepared because the company has been unable to get satisfaction from GM, although several discussions have been held on the matter since last February.

It is significant to note that, in addition to being GM's biggest single customer for buses, Greyhound is also one of the firms named as co-conspirators in the government's monopoly case against GM.

When and if the damage suit is actually filed, General Motors will have its hands full fighting two legal battles.

THE BULL OF THE WOODS — By J. R. Williams

THAT'S A TOUGH SPOT TO BE IN, TO BUILD UP A OUTFIT SO EFFICIENT THAT THEY DON'T NEED TO COME TO YOU FER ADVICE ANY MORE-- YOU MUST GET LONELY!
WELL, I GUESS THEY THINK THEY'LL GET MORE TIME FOR FISHIN', BUT THEN YOUR EFFICIENT OUTFIT GETS SO THEY DON'T EVEN ASK YOU HOW MANY FISH YOU CAUGHT--THEN YOU HAVE TO GO TO THEM WITH TH' FISH TO PROVE IT!
THE HERMIT
J.R.WILLIAMS 8-1
© 1956 by NEA Service, Inc. T.M. Reg. U.S. Pat. Off.

BETTER PROTECTION FOR OIL FILM BEARINGS

To assure highest operating efficiency, bearings of back-up rolls must get maximum protection. With *Texaco Regal Oil* in roll stand circulating systems, that protection is assured. *Texaco Regal Oil* keeps them clean for an uninterrupted flow of lubricant. This means smoother operation, an increased production rate, reduced maintenance costs.

Texaco Regal Oil is made to order for steel mill service. It has outstanding resistance to oxidation, emulsification and sludging—separates quickly from water. Even under the heaviest loads, it assures normal bearing temperatures.

For the most effective lubrication of enclosed reduction gears, use *Texaco Meropa Lubricant.* It resists oxidation, thickening and foaming—remains stable under extreme pressures. Thus, gear life is prolonged, operation is smoother and more dependable.

Specialized Texaco Lubricants can help you keep production up, costs down. Consult a Texaco Lubrication Engineer for complete details. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Lubricants, Fuels and Lubrication Engineering Service

Is Britain Pushing Red Trade Too Far?

Administration is concerned over growing trade through Hong Kong . . . Britain apparently will broaden China trade . . . Dominions are also to work out own deals . . . Machinery involved—By G. H. Baker.

◆ U. S. OFFICIALS who administer foreign trade rules are casting a sharp—and critical—look at the British port of Hong Kong. They don't like what they see—namely, big gains in the volume of strategic goods moving through Hong Kong into Communist China. The rise in this tonnage in recent weeks is described as "considerable."

Government officials here are of the opinion that the sudden increase in British trade with the Chinese Reds is a direct reflection of (1) Communist China's desperate need for machinery and manufactured goods, so that she can better support her war economy, and (2) the British desire for increased foreign trade, no matter what the eventual consequences.

In London, the Eden Administration recently announced its decision to lengthen the list of commodities that qualify for trade with Communist China. In addition, each dominion and area in the Commonwealth has been told to go ahead and work out its own trade deals with the Communists without prior clearance from London.

According to reports reaching Washington, the big-volume shipments now streaming through the Port of Hong Kong on their way to the Communists include machinery of all types, motor vehicles, and some metals.

Atomic AA

It's now official that our ground-to-air missiles of the future will carry atomic warheads. This means that the anti-missile installations which now ring our larger cities will soon be dealing entirely with nuclear weapons. The Nike and other similar ground-to-air missiles will be capable of wiping out not only approaching enemy aircraft, but also enemy missiles.

Firms engaged in the fabrication of portions of ground-to-air missiles should take note that the Defense Department intends to increase substantially its procurement of these missiles during the next three years.

It also means that the government will have to increase its production of fissionable materials in order to supply the fuel for the vast destructive power of the missiles. This could mean that firms in need of fissionable materials for peaceful uses might be passed up for a time.

Tech Aid Works

Is U. S. technical assistance to the so-called "backward areas" of the world really effective? A Senate committee recently did some soul-searching on this question. The committee's answer: Despite a lot of waste and many blunders, the program is basically effective in winning converts for the U. S.

Most of the dollars spent to bring water systems, better farming, and power plants to remote areas of the world have produced results in the U. S. interest.

Social Security—More Benefits, Higher Costs

▪ Expansion of social security law will bring slightly higher costs and more bookkeeping to industry.

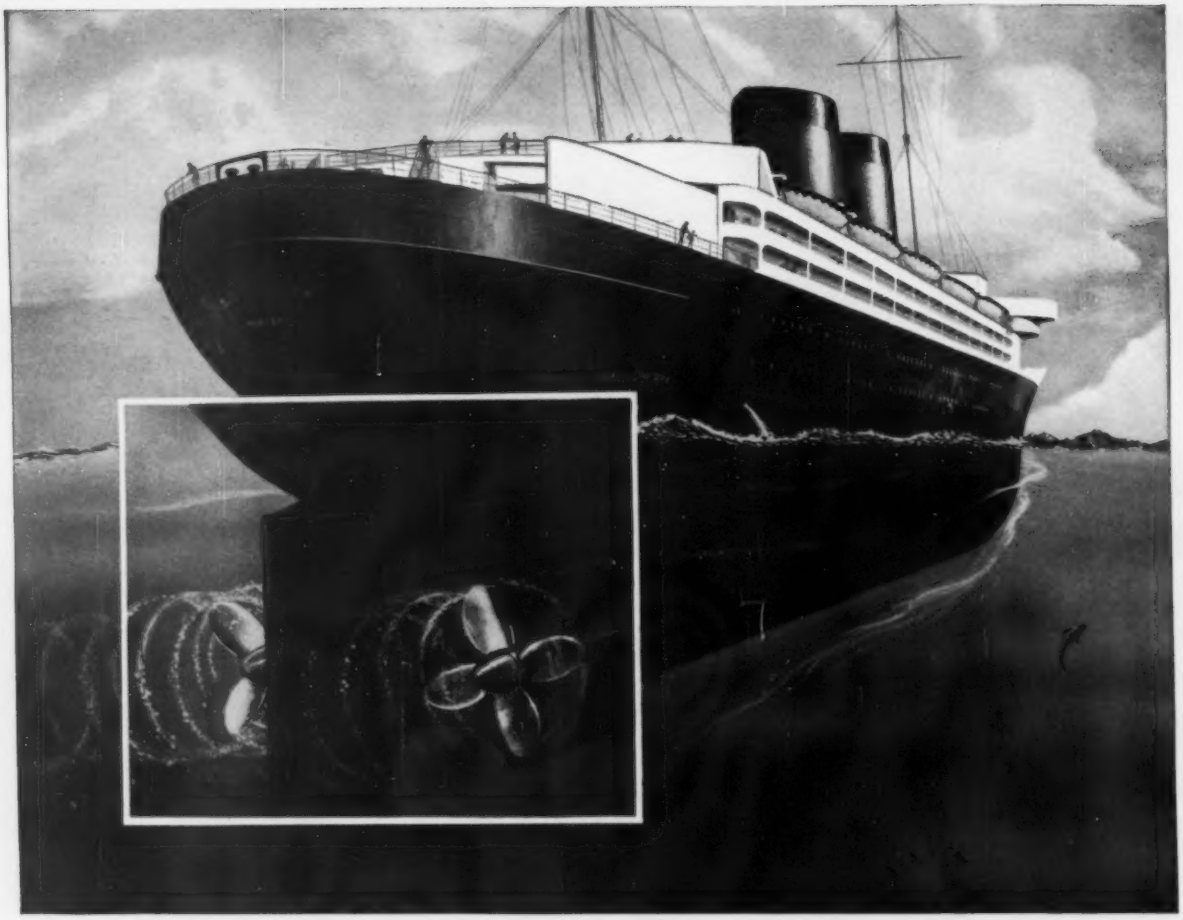
▪ Congress lowered the age when women will be eligible to draw benefits to 62; added a "disability" provision; and increased taxes slightly.

▪ The disability section will permit permanently and totally disabled workers to retire and draw benefits at 50, instead of 65.

▪ Addition of the disability section is the second major liberalization of the law. First was aid to widows and minor children of deceased workers.

▪ Under the disability plan, 250,000 persons will draw an average $75 a month for the first year.

▪ To pay for these benefits, tax was increased by ¼ of one pct, on both employees and employers. Maximum increase will be $10.50 a year for both on the first $4200 earnings.



What a ship can show you about COPPER

Ocean-going vessels put any metal to the test.

Salt water under the hull, salt air over the superstructure . . . these tend to "eat away" metals less corrosion-resistant than copper.

The British Admiralty found, in 1870, that adding *tin* to "cartridge brass" greatly increased its resistance to corrosion at sea. Hence the alloy known today as "Admiralty Metal." Since those days, many other copper alloys have been developed with even greater resistance to corrosion.

Now, your Company may never wish to build a huge ship's propeller or a vast rudder or a steersman's wheel or even a navigator's sextant.

But if you make *any* product that can be improved by adding to its durability and resistance to corrosion, copper is for you.

Whether your product goes to sea or serves ashore, the *workability* of copper's many alloys is another advantage to you. They join readily . . . are easy to form . . . plate and polish beautifully . . . . . . and they *stand up in service* wherever you put them to work . . . on board or on shore!

COPPER & BRASS
RESEARCH ASSOCIATION

420 Lexington Avenue, New York 17, N. Y.

. . . AN INDUSTRY SOURCE OF TECHNOLOGICAL AID, INCLUDING A LIBRARY OF TECHNICAL LITERATURE AND A COUNCIL OF SPECIALISTS

COPPER OR ITS ALLOYS PROVIDE THESE ADVANTAGES:

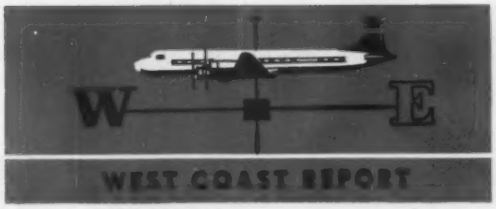
Best conductor of electricity commercially available

Does not rust . . . high corrosion resistance

Best heat transfer agent of all commercial metals

Easy to machine, form, draw, stamp, polish, plate, etc.

Welds readily . . . excellent for soldering and brazing



Ranch Living Spurs Furniture Sales

Western summer furniture manufacturers play important part in opening new market vistas . . . Los Angeles designers set style trends in patio appointments . . . Metal accessories growing in demand—By *R. R. Kay.*

◆ FARWEST INFLUENCE on modern living — ranch houses, patios and outdoor barbecues—and the region's industrial capacity have made it the geographical hub of the outdoor summer furniture industry.

Fresh designs and original ideas by Western fabricators are major factors in the rise of the summer furniture industry to one of national importance. Retail sales in 1955 soared to $320 million compared to about $90 million in 1946.

Los Angeles, with the country's largest concentration of plants—40 out of a national total of 100—enjoys the highest dollar volume. About 1000 are employed by the industry here.

Easteners Go West . . . Who buys? Westerners, of course. But a healthy 35 pct of the output is absorbed east of the Mississippi.

With new designs, metals and finishes, the outdoor furniture industry here points the way for producers across the country.

Brass, now added, peps up the austere black iron. Anodized aluminum with its golden finish, is another comer. Such products as expanded metal and spring steel also are being incorporated in new designs to advantage.

Some best sellers: aluminum chaises, folding chairs, tables, umbrellas, awnings; chrome-plated tubular steel chairs, tables and serving carts; wrought and cast iron furniture.

List Goes On . . . Add to this booming business $3 million for portable barbecues of stainless steel, braziers, and accessories such as tongs, hoods, spit forks, grills and motors for rotisseries. Swimming pool needs, such as fittings, plumbing, ladders, heaters, filter, and vacuum equipment account for more millions. Patio torches and lighting fixtures offer a sizable market, too.

Portable barbecues, braziers, and accessories especially are big business. And look for them to get even bigger as the outdoor living trend catches on even more. Big Boy Mfg. Co., Inc., probably the largest of a dozen good-sized U. S. companies in the business, now sells half its wares east of the Rockies. Only five years old, this Burbank, Calif., firm turns out up to 5000 units per day during the peak.

The most popular units cost from $9.95 to $49.95. Hottest seller is the $24.95 job, with rotary equipment. For the big spenders, Big Boy makes a $300 super deluxe model. And there's a fat market for accessories: charcoal tongs, fire rakes, chrome wire spit baskets, stainless steel heat reflectors.

Sales Go Up . . . Look what the outdoor living yen did for another metalworking firm. Araco Manufacturing Co., Phoenix, Ariz., opened its doors in January. By mid-year it sold about $250,000 worth of aluminum outdoor furniture. Volume increased 50 pct each month since the opening. And the upward trend continues. The plant is working on a round-the-clock schedule. Present annual payroll: $364,000.

It's a good bet there will be more of this type of success story in Arizona. Why? New homes stress outdoor living. And products makers will have a big advantage with a major supplier of aluminum right in their own back yard. Reynolds Metals Co.'s extrusion plant, probably the world's largest, is in Phoenix.

What's Wrong With Aircraft Companies?

■ **Aircraft manufacturers, on the average, are not making excessive profits, according to a House Armed Services subcommittee, but the group does see some shortcomings in the plane procurement program.**

Among the criticisms are:

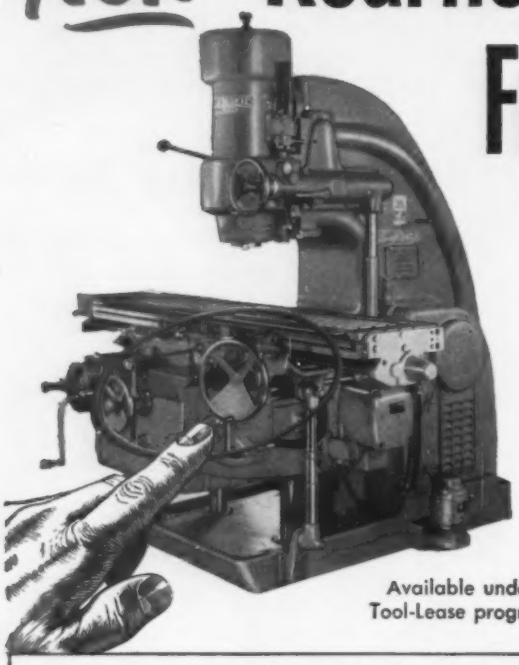
(1) Some of the big salaries and bonuses paid to officials of aircraft companies and charged indirectly to the government are "excessive."

(2) Military services' methods of renegotiating profits on planes are unsound.

(3) The practice of plane makers of hiring retired military officers creates a "doubtful atmosphere."

Without singling out a specific firm or executive, Rep. F. Edward Herbert, subcommittee chairman, warned the industry that these practices are "dangerous business."

Now Kearney & Trecker has Front-Mounted *(convenience-engineered)* Handwheel



Available under Tool-Lease program

Standard equipment on new TF Series milling machines — front-mounted for faster table settings ... positioned to prevent errors

THE front-mounted table handwheel is a standard feature on all Kearney & Trecker new TF Series, knee-type milling machines — Plain, Universal and Vertical. Mounted on the right front of the saddle and projecting diagonally, the newly positioned handwheel is a part of Kearney & Trecker's up-front central control grouping.

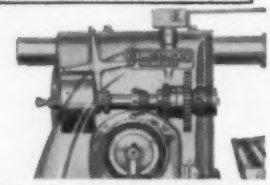
Because the handwheel is ideally located so as to simplify operation of the machine, the operator makes table settings more accurately — in less time and without leaving his normal operating position. It measurably reduces operator fatigue.

In addition, the new TF's give you a combination of more outstanding design and operating features (illustrated at left) than any other knee-type milling machine on the market today. They're available in five sizes — No. 2 to No. 6 from 10hp to 50hp.

For complete specifications, and what these TF's can do for you, see your nearest Kearney & Trecker representative, or write direct to Kearney & Trecker Corp.

5 more reasons why TF Series milling machines are so easy to operate

Heavier, Wider, One-Piece Knee — The TWIN SCREW arrangement supports the heavier, larger knee. Span and length of ways is increased considerably, providing fuller saddle support . . . lasting accuracy . . . substantial reduction of way and gib wear.



Three-Bearing Spindle — Complete assembly consists of three heavy-duty bearings, flywheel, a train of wide-faced forged steel gears. Rigidity of spindle unit contributes to increased cutter life, better finish and quieter operation.

Double "Vibra-Veld" Overarms — Two solid steel bars, mounted completely through column, void vibration at source, afford more rigidity and resistance to deflection than any other type support. Design also greatly simplifies changing of arbors and cutters.

Twin Screw Knee Support — Exclusive double-support arrangement most effectively distributes weight of new machines' much wider, heavier knee, saddle and table. Balanced design increases stability under heaviest loads . . . offers greater resistance to torsional thrust under all cuts.

Massive Column — Solid back, double-box section column is scientifically ribbed throughout to rigidly withstand heaviest cutting forces. Full bearing column face affords maximum support for the knee. Cross-mounted motor assures maximum ventilation, easy access for routine maintenance.

KEARNEY & TRECKER
MILWAUKEE
BUILDERS OF
PRECISION AND PRODUCTION MACHINE TOOLS SINCE 1898

KEARNEY & TRECKER CORP.
6792 W. National Avenue, Milwaukee 14, Wisconsin
Please send me Catalog No. TF-50 with details on new line of TF Series Plain, Universal and Vertical milling machines.

Name.....
Title.....
Company.....
Address.....
City.....Zone.....State.....

Odds Shift On $1 Billion Goal

First half indicates metal cutting, grinding machine makers will not ship billion dollars worth in 1956 . . . June shipments off slightly from May . . . Still better than 1955—*By E. J. Egan, Jr.*

◆ IT'S BEGINNING to look like U. S. builders of metal cutting and grinding machines won't hit the 1956 shipment total of $1 billion they were hoping for. First-half totals have shifted the odds to pretty long against it.

June shipments, $75.9 million, were down a bit from May deliveries of $76.8 million. The slight dip had some effect on holding the first-half shipment total down to $417.9 million.

Even though below expectation, the tally for the first six months is a lot healthier than the $324.7 million worth shipped in the like period last year. But it doesn't give builders much of an advantage for the 1956 stretch run. To hit the magic $1 billion mark by December 31, they'll have to ship at an average rate of $97 million monthly from now on. It's not likely that they'll do it.

Backlog . . . True, the industry still has an eight-month backlog to work with. But there doesn't seem to be any gargantuan effort in the works to hack this down to any real degree. Could be that unfilled orders will be cleaned up quite handily even if builders do nothing more than produce at the current rate.

Thing to watch is the new order rate, and more particularly something called "net new orders." The phrase deserves some explanation; this is the first time it has appeared on this page.

It's the result of a decision announced recently by the National Machine Tool Builders' Assn. Idea is to note the effect that cancellations every month have on new order totals for the same period.

Here's How . . . For example, NMTBA reported gross new orders for June as $70 million, on the nose. In the same month, builders reported receipt of domestic and foreign cancellations adding up to $7.6 million. Deducting the latter figure leaves $62.4 million "net new order" total for June.

The fact that cancellations apply mostly to orders taken before June doesn't enter the picture. The point is that NMTBA prefers the net new order figure as the most accurate tabulation of industry performance in sales.

June new business is the lowest for the year thus far. It fell about $25 million below the May total, dropping the industry back to the dollar-volume area in which it was operating last summer, just before the Chicago Machine Tool Show.

"I didn't say you had to announce the postponement of vacation schedules in the cafeteria!"

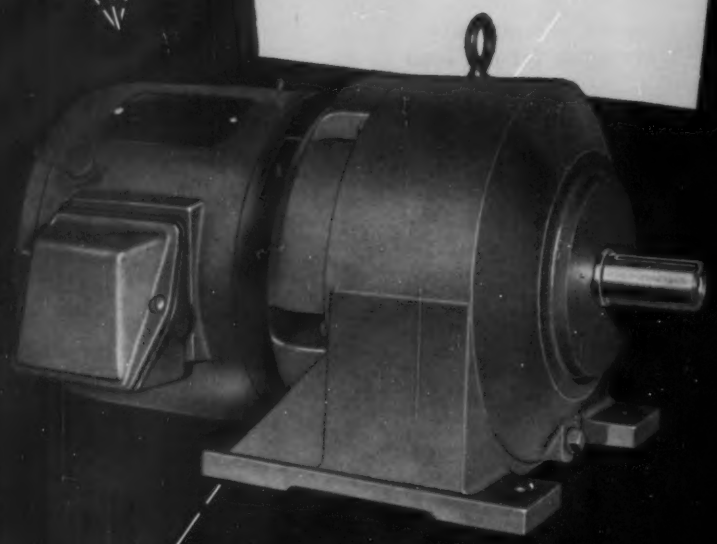
Why . . . No one factor can be tagged as responsible for a $25 million new order drop between May and June. Some builders attribute it to "the usual summer doldrums"; others say it's because the "automotive firms are out of the buying picture for awhile"; still others say "we haven't been hurt at all."

To their credit, most builders are willing to shrug off temporary sales soft spots. They prefer to spend less time worrying about what can't be helped and more time planning for steady future growth.

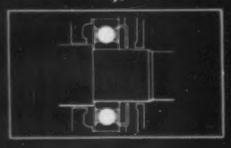
They expect growth in two areas: (1) replacement of obsolete equipment; (2) purchases of newly developed machine tool types.

Next Decade . . . In a recent speech Walter W. Tangeman, board chairman of Cincinnati Milling Machine Co., said: "The metalworking industry could, and many believe it will, increase from 30 to 40 pct in the next 10 years. To accomplish this a lot of high class metalworking equipment will be needed in our factories. The trend of the metalworking equipment industry seems clearly upward as our population and gross national production increase."

Don't overlook what you can't see



You can't always see what makes a gearmotor outstanding. It's the attention paid to small design details that makes the difference. Here are a few of the details that make the new Reliance Gearmotor stand above the rest.



FOOLPROOF METERMATIC motor bearing lubrication and oil bath gear lubrication for long-life protection against wear.

INDUCTION HARDENING of the tough alloy steel gears gives a perfect combination of wear resistance and strength.

SIMPLIFIED GEARING with few moving parts reduces friction losses and lessens chances of breakdown.

THRUST BEARINGS handle heavy overhung loads safely by placing strain on the frame instead of the shafts.

Find out the complete story for yourself— contact your Reliance representative or write for Bulletin E-2408.

E-1509

REDUCE SPEED

RELIANCE ELECTRIC AND ENGINEERING CO.

CLEVELAND 10, OHIO • OFFICES IN PRINCIPAL CITIES

Canadian Division: Welland, Ontario

The Iron Age

SALUTES

Orrin B. Werntz Executive vice president of one of the nation's leading trade organizations, he bonded a young industry into a smooth-running association. His unusual career had a legal start then led to the Fourth Estate.

"What's the pitch?" Whether you are speaking of an airplane propeller, a sales talk, a legal argument, or the diameter of a screw, Orrin Benson Werntz is the man who can give you the answers. His 19 years as executive vice president of the National Screw Machine Products Assn. were preceded by experience in the professions of law, journalism, and sales. In unpremeditated fashion, he had equipped himself ideally for the position he now holds.

The part played by his association in the economic scene he regards as more than just a business arrangement—it is the voice of a vital industry representing the livelihood of thousands and the investment of millions of dollars in equipment and engineering research. To Ben Werntz, American industry would literally fall apart if it weren't for his friends in the NSMPA.

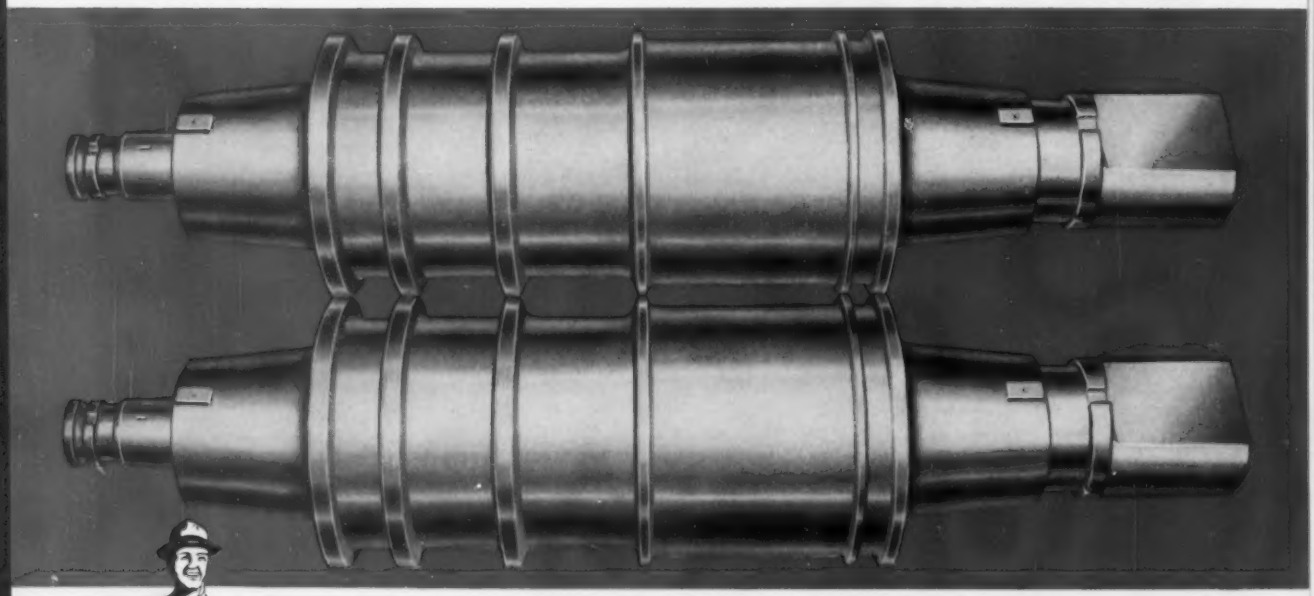
What makes him especially noticeable as helmsman of one of the nation's leading trade associations is his human perspective. His devotion to the people that make up NSMPA is more than required of a trade group director. To the membership, he is regarded as a true and sincere friend.

A graduate of Western Reserve Law School and a member of the Cleveland and Ohio State bar associations, he spent six years practicing law on his own. And he is especially proud of his stint as police reporter for the Cleveland *Press* and as assistant city editor for the now-defunct Cleveland *Times*. Likewise, he boasts a solid background in the screw machine products industry. Starting in 1930, he worked for National Acme Co. in the sales and legal departments for seven years. He is former vice president of the American Trade Assn., and was managing director of the Pressed Metal Institute.

Ben Werntz manages to combine work with his favorite pastime—flying. He pilots his Cessna-170 to all parts of the continent on business engagements. And last year, he competed in a Junior Chamber of Commerce air cruise from Palm Springs, Calif., to Philadelphia.

Ohio Rolls

correct roll design— rigid quality controls— where roll life begins!



The service life of Ohio Rolls begins with integrated planning by a group of specialists analyzing roll requirements . . . Ohio's designers—metallurgists—chemists —engineers—foundrymen—and inspectors . . . working directly with *your* Ohio Roll Representative. Their job is to make sure that Ohio Rolls meet rigid job specifications—in design, metal analysis, hardness, tensile strength, dimension and finish. These are operations that require specific planning to make certain that Ohio Rolls deliver High Tonnage . . . give Long Life . . . and Satisfactory Service.

OHIO ROLLS SERVE THE WORLD

When you need rolls—large or small—call in your Ohio Roll Representative. He understands production requirements, and he can help you solve your roll problems quickly and efficiently.

shaping metal for all industry

Carbon Steel Rolls	Ohio Double-Pour Rolls	Nickel Grain Rolls
Ohioloy Rolls	Chilled Iron Rolls	Special Iron Rolls
Ohioloy "K" Rolls	Denso Iron Rolls	Nioloy Rolls
Flintuff Rolls		Forged Steel Rolls

THE OHIO STEEL FOUNDRY COMPANY

LIMA, OHIO

Plants at Lima and Springfield, Ohio

ORB

The Iron Age INTRODUCES

Thomas A. Kelly, elected executive vice president, **La Salle Steel Co.,** Hammond, Ind.

R. R. Allen, named vice president and director, engineering and research, **John Wood Co.,** New York.

Frank O. Phillips, appointed asst. to vice president, steel, **U. S. Steel Corp.**

John B. Giacobbe, appointed director, Nuclear Products Div., **Superior Tube Co.,** Norristown, Pa.

Herman H. Flaum, appointed superintendent, cold and hot header operations, Cleveland plants, **Cleveland Cap Screw Co.,** Cleveland.

David W. Singley, appointed general superintendent, Henry Disston Div., **H. K. Porter Co., Inc.,** Philadelphia.

Thomas R. Lawson, appointed to staff of vice president, Motor and Control Div., **Westinghouse Electric Co.,** Buffalo, N. Y.; **L. L. Clark,** named acting sales manager, West Coast plant.

Karl F. Ewerhardt, appointed asst. general sales manager, Leschen Wire Rope Div., **H. K. Porter Co., Inc.,** St. Louis, Mo.

David Matter, appointed manager, iron foundry service, **Ohio-Ferro-Alloys Corp.,** Canton, O.

A. M. Bell, Jr., appointed division manager, Production Div., **The Gulf Oil Corp.,** Denver.

Elton A. Turner, named manager, finance, Metallurgical Products Dept., **General Electric Co.,** Detroit.

Herman H. Kremer, named staff manager, rod and wire, **Chase Brass & Copper Co.,** Waterbury, Conn.; **Allan R. Armstrong,** named staff manager, tube sales; **John J. Vreeland,** named staff manager, sheet and strip.

Robert C. Conant, named manufacturing manager, Jackson Div., **Aeroquip Corp.,** Jackson, Mich.

William W. Burnham, named asst. sales manager, Philadelphia, **Universal Atlas Cement Co.,** New York.

Philias H. Girouard, appointed asst. director, engineering, **Consolidated Electrodynamics Corp.,** Pasadena, Calif.

Frank Boufford, appointed Western regional sales manager, Yale Materials Handling Div., **The Yale & Towne Manufacturing Co.,** Philadelphia.

William E. O'Neill, named sales manager, **"Automatic" Sprinkler Corp. of America,** Youngstown, O.

Frank J. Finn, appointed manager, Salem plant, **The Yale & Towne Manufacturing Co.**

FRANK G. KAUFMAN, named director, plant improvement, Standard Pressed Steel Co., Jenkintown, Pa.

CHARLES R. C. STEERS, named purchasing agent, Russell, Burdsall & Ward Bolt and Nut Co., Port Chester, N. Y.

RAY BRANDENBURG, named field engineer, graphitic tool steels, The Timken Roller Bearing Co., New York.

WILBUR J. COMERFORD, appointed specialty products engineer, Alloy Tube Div., The Carpenter Steel Co., Union, N. J.

H. S. Spaulding, appointed general staff metallurgist, Fabrication Div., **Kaiser Aluminum & Chemical Corp.,** Oakland, Calif.; **J. A. Ketchum,** named technical superintendent, rod, bar, wire and electrical conductor plant, Newark, O.

Joe White, named district sales manager, materials handling equipment, Chicago area, **Conco Engineering Works,** Mendota, Ill.

Joseph B. Milgram, Jr., named chemicals sales engineer, **Foote Mineral Co.,** Philadelphia.

Forrest Stretmater, named chief metallurgical engineer, Aluminum firm's Sales Div., **Reynolds Metals Co.,** Louisville, Ky.

Vincent Anson, appointed merchandising manager, galvanized ware, Container Div., **Jones & Laughlin Steel Corp.,** Toledo, O.

Leo M. Monroe, named manager, industrial equipment sales, **Brush Electronics Co.,** Cleveland

John V. E. Hansen, named administrative asst. to director, research, **National Research Corp.,** Cambridge, Mass.

Arthur S. Minto, named manager, purchasing and material control, **The Morgan Engineering Co.,** Alliance, O.

W. E. Thomas, appointed regional manager, Valve Div., **Homestead Valve Manufacturing Co.,** Coraopolis, Pa.

Harold J. Le Beck, appointed asst. to manager, Industrial Plastics and Bearings Div., **Joseph T. Ryerson & Son, Inc.**

R. F. Bartlett, named branch manager, Dallas, **Copper-Bessemer Corp.,** Mt. Vernon, O.

CHESTER S. JOHNS, named sales manager, standard machines and products, The Cross Co., Detroit.

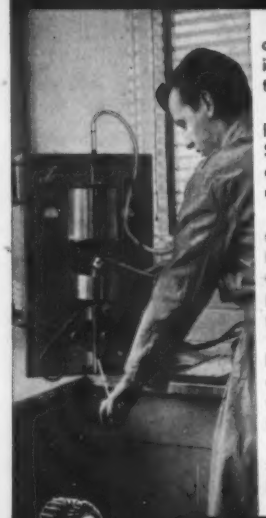
RICHARD K. DICKSON, named chief metallurgist, Trent Tube Co., East Troy, Wis.

DWIGHT L. IMMEL, named general superintendent, Copperweld Steel Co., Warren, O.

JOHN WALLERIUS, named chief engineer, Lindberg Industrial Corp., Chicago, Ill.

Another of the Reasons Behind Brad Foote Quality—

CARBON DETERMINATION



• In hardening gear teeth by carburizing, carbon content and depth of penetration are vitally important. BRAD FOOTE insures precise control of these factors through metallurgical tests with equipment developed specifically for this purpose.

• A test bar goes through the complete carburizing and heat-treating cycle with every batch of carburized gears. Shavings are taken from this bar at carefully measured depths. Chemical analysis of these shavings gives complete and precise data on carbon content and penetration.

• Carbon determination tests are only one of many metallurgical controls that insure the uniform quality of BRAD FOOTE Gears. Metallographic examination, hardness testing, chemical analysis—these are just a few of the quality checks provided by BRAD FOOTE's completely equipped metallurgical laboratories.

• Add these precise controls to specialized production and heat-treating equipment and a wealth of detailed experience in producing gears of all types—you begin to appreciate why BRAD FOOTE can produce better quality gears at substantial savings.

• Find out how BRAD FOOTE quality can save you money. Send us the specifications on your next job for quotation. No obligation of course. BRAD FOOTE MAKES ALL TYPES OF GEARS—IN A COMPLETE RANGE OF STYLES AND SIZES

BRAD FOOTE GEAR WORKS, INC.

1309 South Cicero Avenue • Cicero 50, Illinois

Bishop 2-1070 • OLympic 2-7700 • TWX CIC-2856-U

subsidiaries | AMERICAN GEAR & MFG. CO. Lemont, Illinois / Phone Lemont 920 • PITTSBURGH GEAR COMPANY Pittsburgh 25, Penn. / Phone SPalding 1-4600

For your finest products

J&L STEEL

Sheets

Your particular requirements for uniformity in workability, formability and drawing properties guide every step in the production of J&L Sheet Steel.

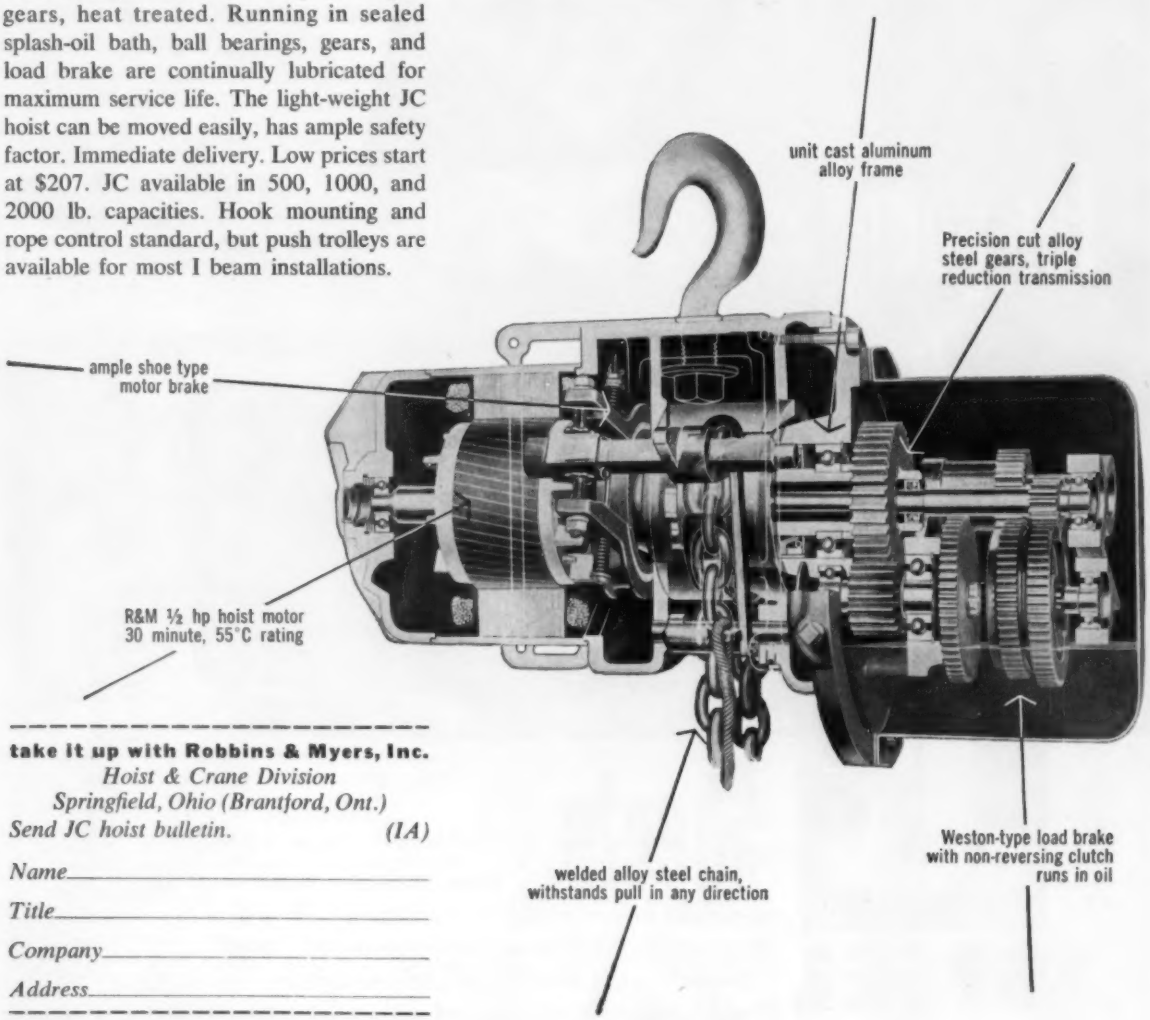
Depend on J&L Sheet Steel to help you get the best out of your production equipment and add to the value of your finished product.

Serving Steel Users Everywhere —Linked by Water to the Middle West and South

Jones & Laughlin
STEEL CORPORATION · PITTSBURGH

JC chain hoists are ahead of competition in quality—right with it in price. See for yourself why more value for the same money is yours in the JC. The ½ hp R&M heavy duty motor is equipped with an oversize shoe brake to assure quick stops, accurate load spotting, longer life. Separate load brake is Weston-type, with non-reversing clutch to prevent drift. Gearing—triple reduction precision cut alloy steel spur gears, heat treated. Running in sealed splash-oil bath, ball bearings, gears, and load brake are continually lubricated for maximum service life. The light-weight JC hoist can be moved easily, has ample safety factor. Immediate delivery. Low prices start at $207. JC available in 500, 1000, and 2000 lb. capacities. Hook mounting and rope control standard, but push trolleys are available for most I beam installations.

quality to spare

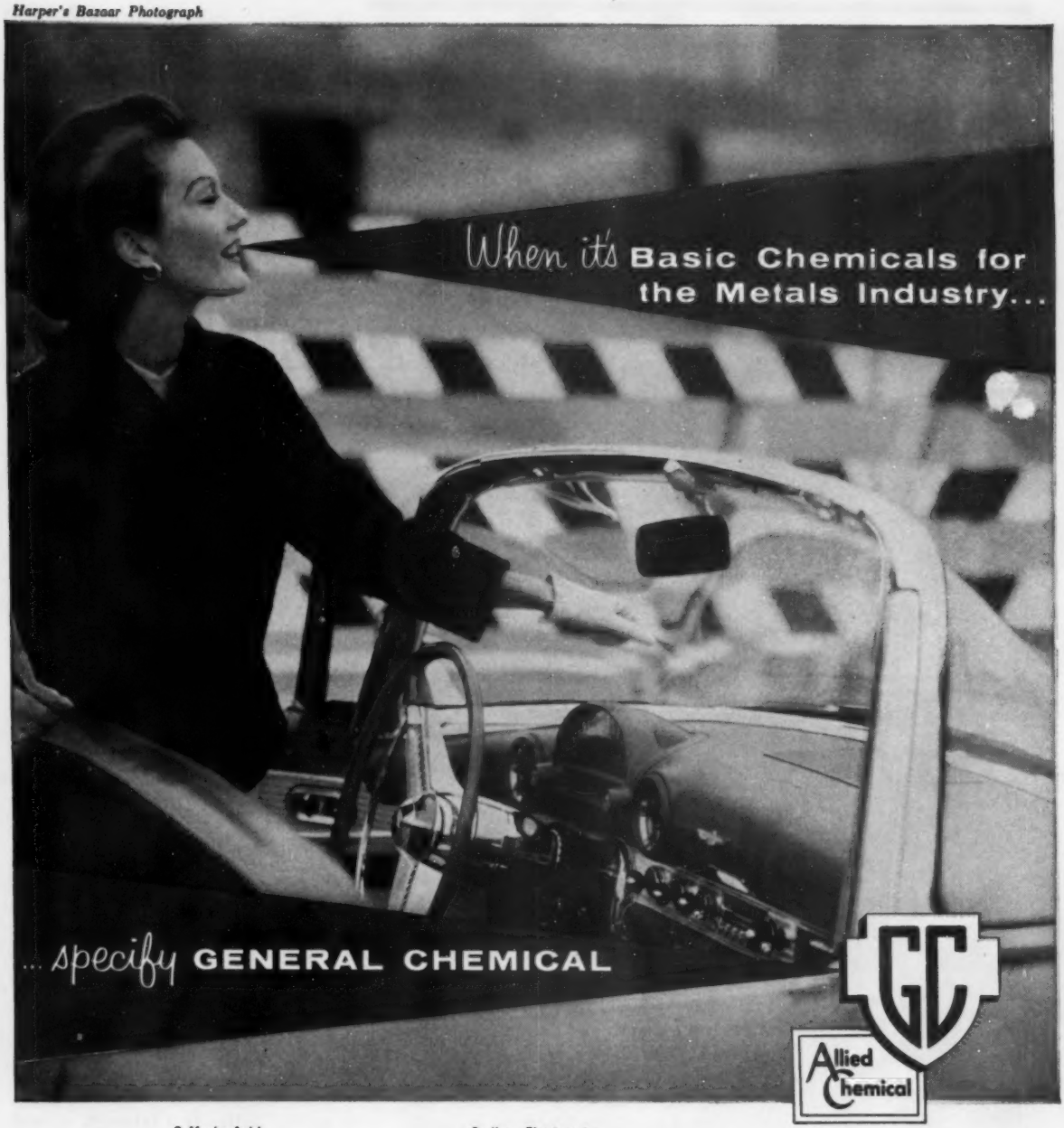

unit cast aluminum alloy frame
Precision cut alloy steel gears, triple reduction transmission
ample shoe type motor brake
R&M ½ hp hoist motor 30 minute, 55°C rating
welded alloy steel chain, withstands pull in any direction
Weston-type load brake with non-reversing clutch runs in oil

take it up with Robbins & Myers, Inc.
Hoist & Crane Division
Springfield, Ohio (Brantford, Ont.)
Send JC hoist bulletin. *(IA)*

*Name*_____
*Title*_____
*Company*_____
*Address*_____

ROBBINS & MYERS **hoists • cranes • winches**

Harper's Bazaar Photograph



Sulfuric Acid
Hydrochloric (Muriatic) Acid
Nitric Acid
Hydrofluoric Acid
Sodium Fluoride
Sodium Bifluoride
Trisodium Phosphate
Sodium Metasilicate
Oxalic Acid
Fluoboric Acid
Potassium Fluoborate

Sodium Fluoborate
Ammonium Fluoborate
Lead Fluoborate
Tin Fluoborate
Copper Fluoborate
Iron Fluoborate
Nickel Fluoborate
Cadmium Fluoborate
Other Heavy Chemicals

B&A Laboratory Reagents and Fine Chemicals

BASIC

CHEMICALS FOR

AMERICAN INDUSTRY

GENERAL CHEMICAL DIVISION

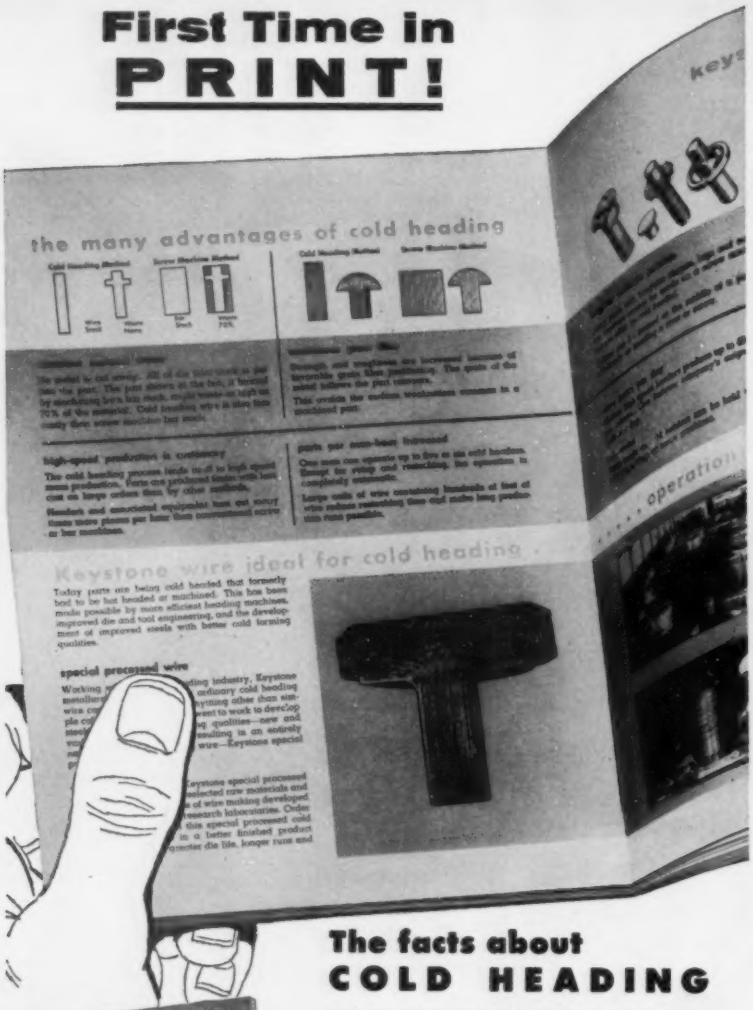
ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.

Offices: Albany • Atlanta • Baltimore • Birmingham • Boston • Bridgeport • Buffalo • Charlotte Chicago • Cleveland • Denver • Detroit • Greenville (Miss.) • Houston • Jacksonville • Kalamazoo Los Angeles • Milwaukee • Minneapolis • New York • Philadelphia • Pittsburgh • Providence San Francisco • Seattle • St. Louis • Yakima (Wash.)

In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

First Time in PRINT!



The facts about COLD HEADING

SEND FOR THIS BOOKLET TODAY!

Every metalworking man—engineer, buyer, executive—should read this new booklet presenting many up-to-date facts about the *flowability* of Cold Heading Wire. It contains illustrations, diagrams, and technical facts useful to anyone in the modern, wire fastener industry. See how the most complicated and intricate parts can be cold headed. Mail coupon today for your free copy!

Keystone Steel & Wire Company
Peoria 7, Illinois

KEYSTONE STEEL & WIRE COMPANY, PEORIA, ILLINOIS A12

Please send me the new booklet on Cold Heading Wire.

NAME _____ TITLE _____

COMPANY _____

STREET _____

CITY _____ STATE _____

KEYSTONE WIRE for Industry

J. Davidge Warfield, named administrative ass't to president, **Morse Chain Co.,** Ithaca, N. Y.

G. A. Vogel, appointed senior contracting manager, New York district office, American Bridge Div., **U. S. Steel Corp.,** Pittsburgh; **J. H. Long,** appointed ass't to vice president, N. Y.

Henry F. Castle, named manager, Chicago branch office **The Colson Corp.,** Elyria, O.

Howard W. Carlisle, appointed general manager, Hamilton, O., plant, **Clearing Machine Corp.,** Div. of U. S. Industries, Inc.

James F. Beré, appointed general manager, **Axelson Manufacturing Co.,** Los Angeles, Div. of U. S. Industries, Inc.

Ronald J. Lang, joined the industrial sales and service staff, **Wyandotte Chemicals Corp.,** Wyandotte, Mich.; **Kenneth R. Curry,** joined the New York City district office.

John M. Mele, named abrasive engineer, New York, **Bay State Abrasive Products Co.,** Westboro, Mass.

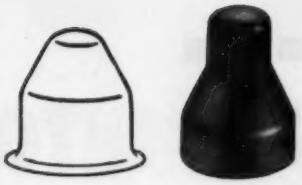
Gordon M. Piotrowski, named district application engineer, Chicago, **Clark Controller Co.,** Cleveland.

Following appointments are within the Ohio Seamless Tube Div., **Copperweld Steel Co.,** Shelby, O. **Julius H. Clabaugh,** named asst. manager, operations; **Francis S. Coleman,** named chief engineer; **George P. Jones,** named asst. chief engineer; **Donald R. Chew,** named manager, Quality Control Dept.

OBITUARIES

Joseph K. Bole, Jr., 50, asst. manager, sales, Bolt and Chain Div., **Republic Steel Corp.**

Gerald Frink, president, **Washington Iron Works,** Seattle, Wash.



PREFORM 1 1/16" dia. 1 1/16" high

FINAL FORM 1 1/16" dia. 2 1/4" high

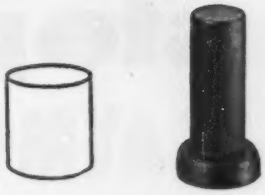
2 OPERATIONS plus anneal—.032" AMS 5521. Jet engine part formed by redrawing a cup.

PREFORM 3 1/4" dia. 3 1/4" high

FINAL FORM 2 1/8" dia. 5 1/8" high

PREVIOUS METHOD

2 OPERATIONS—.043" AMS 5540. Jet engine part formed by redrawing a cup. Part at right shows previous forming method of welding two stamped sections together.



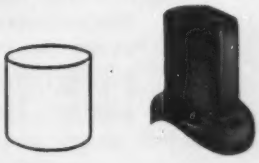
PREFORM 1 1/2" dia. 1 3/4" high

FINAL FORM 1 1/16" dia. 2 3/8" high

2 OPERATIONS—.020" Hy Mu 80. Part formed by redrawing a cup.

Hydroforming

takes less time, less dollars to form tough shapes, tough metals



PREFORM 1 3/8" dia. 1 1/4" high

FINAL FORM 1 3/8" long 1/2" wide 1 1/2" deep

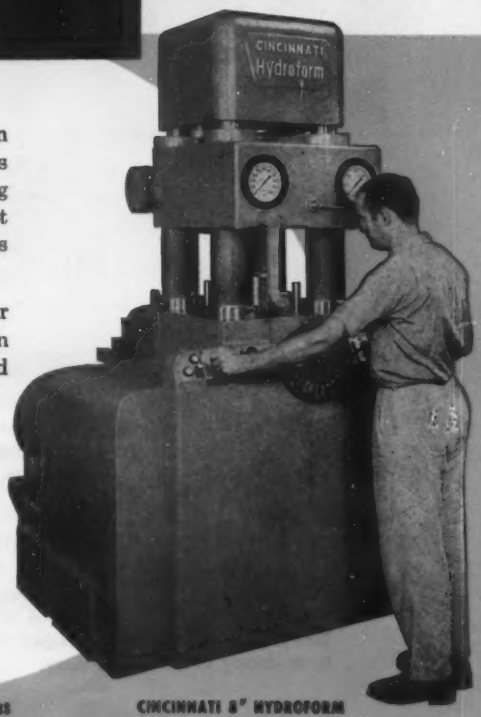
2 OPERATIONS plus anneal—.025" Brass. Instrument cover formed by drawing a cup into the final rectangular shape.

■ Shown here are several parts drawn on Cincinnati Hydroform machines. These range from tough shapes of ductile materials to less complex shapes of harder-to-work alloys. In each instance, Hydroforming substantially reduced the number of operations required to form the part conventionally . . . used simple tooling, costing from 25% to 90% less than conventional tools . . . and produced a part of higher quality.

These advantages—better parts, in fewer operations, at lower costs—can be yours by Hydroforming. Let a Process Machinery Division field engineer give you full details. For a description of the process and specifications of the six machine sizes, write for Bulletin M-1908.

1 OPERATION—.030" Brass. Automotive detail.

1 OPERATION—.034" CRS, deep-drawing quality. Previous forming method required drawing the can, cutting a slot in the wall and welding on the protruding section.



CINCINNATI 8" HYDROFORM
Also built in 12", 19", 23", 26" and 32" sizes.

CINCINNATI Hydroform

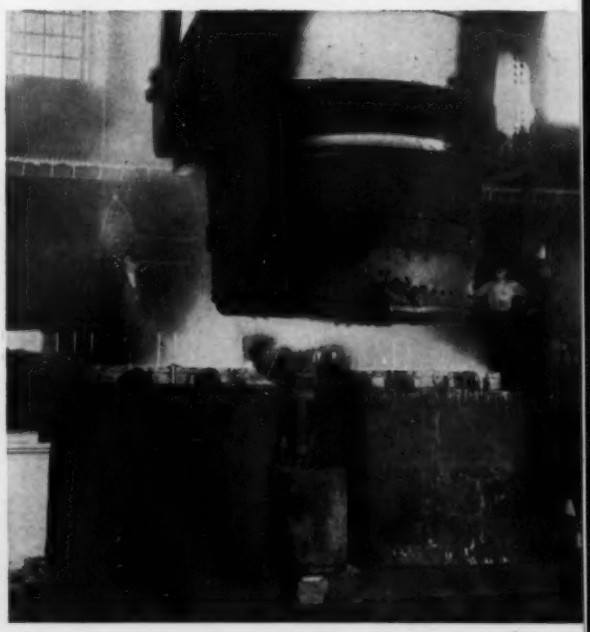
PROCESS MACHINERY DIVISION

THE CINCINNATI MILLING MACHINE CO.

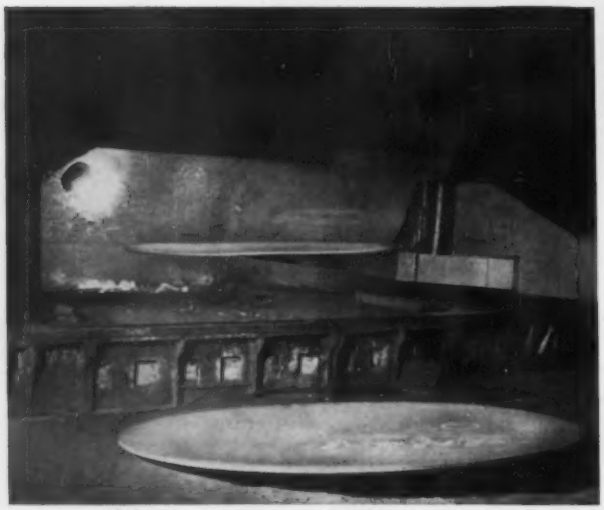
CINCINNATI 9, OHIO, U. S. A.

step by step...
CLAYMONT BUILDS QUALITY INTO

Our customers have been telling us for years that Claymont Flanged and Dished Heads successfully meet every requirement for top quality. The reason behind such high performance is that we build quality into every head throughout every stage of production—from raw materials to finished product. Here's how:



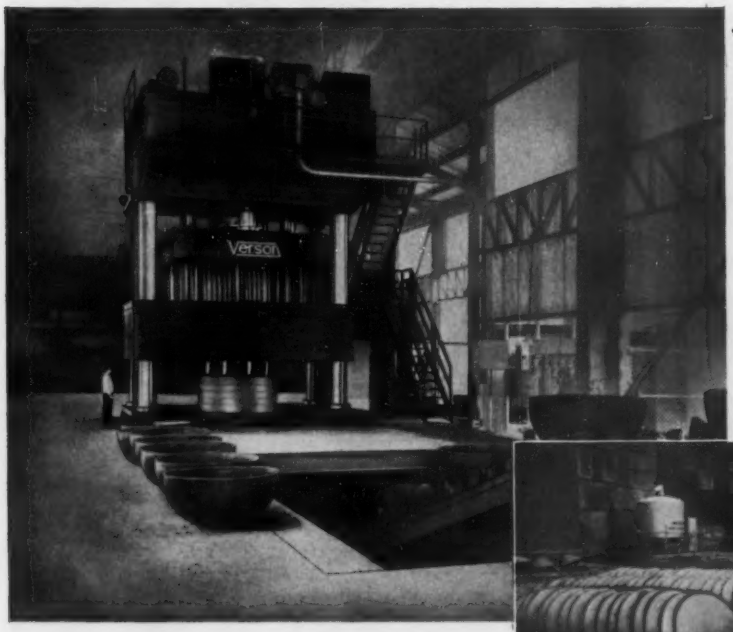
Because we make our own steel, we can carefully control its chemical and physical properties. Here, steel is being "bottom-poured". This means that the ingot mold is filled from the bottom, thus assuring a more uniform steel.



After rolling the ingots into plate, steel circles are sheared to exact size and then heated in huge furnaces like this to the proper temperature for spinning.

This highly skilled craftsman is operating a big spinning machine which produces heads up to 19 feet in diameter. Every head he makes is subjected to careful inspections, both during and after forming.

ITS FLANGED AND DISHED HEADS



Claymont's head pressing facilities include this new 3000-ton giant, capable of hot or cold forming large diameter heads up to 10 feet. With this modern equipment, Claymont can press steel heads that will meet your most exacting specifications.

Stock Heads—You can be sure of quick delivery when you order from Claymont. That's because CF&I maintains large stocks of popular size heads, as well as many types of fittings for tanks and pressure vessels, at these warehouses: Los Angeles, Tulsa, Houston, New Orleans, Chicago, Buffalo and Claymont, Delaware.

and don't forget these other important members of the Claymont family...

- **Alloy Steel Plates**
- **Stainless-Clad Plates**
- **CF&I Lectro-Clad Nickel Plated Steel Plates**
- **Fabricated Steel Parts**
- **Large Diameter Welded Steel Pipe**

Like our heads, all Claymont products have quality built in—by just such painstaking controls and tests during every step of manufacture. For complete information on any Claymont product, contact our nearest sales office or write direct to Wickwire Spencer Steel Division, The Colorado Fuel and Iron Corporation, P.O. Box 1951, Wilmington, Delaware.

4223

CF&I

Claymont Steel Products

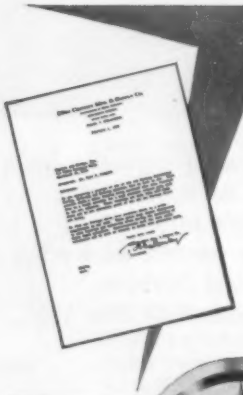
Products of Wickwire Spencer Steel Division • The Colorado Fuel and Iron Corporation

Abilene • Albuquerque • Amarillo • Atlanta • Billings • Boise • Boston • Buffalo • Butte • Casper • Chicago • Denver • Detroit • El Paso • Ft. Worth • Houston • Lincoln • Los Angeles New Orleans • New York • Oakland • Odessa • Oklahoma City • Philadelphia • Phoenix • Portland (Ore.) • Pueblo • Salt Lake City • San Francisco • Seattle • Spokane • Tulsa • Wichita

CANADIAN REPRESENTATIVES AT: Edmonton • Calgary • Vancouver • Winnipeg • CF&I OFFICE IN CANADA: Toronto

Photo courtesy 20TH Century Mfg. & Supply Co., Tulsa, Oklahoma

"We are extremely proud of the job our PORTAGE mills are doing"



The Portage Machine Co.
Akron, Ohio

Gentlemen:

Our business, as you know, is Contractors of Metal Products. This particular job is a steel forging being machined, and when finished will be a fluid cylinder for a high pressure pump used in the oil industry. These forgings are made from AISI-4140 steel and we are extremely proud of the job PORTAGE mills are doing.

We find our PORTAGE mills very accurate. These mills must repeat themselves in each location and operation often during the machining operation. Specifications call for very close tolerances and we have no trouble in doing this precision work.

Yours truly,
20TH Century Mfg. & Supply Co.

R. G. Galloway
President

THE Portage MACHINE CO.

1037 Sweitzer Avenue • Akron 11, Ohio

Representatives in Principal Cities

BUILDERS OF PRECISION MACHINE TOOLS, SPECIAL AND PRODUCTION MACHINERY SINCE 1916

CLOSE-UP of tapping operation shows two-step tap for roughing and finishing threads.

FEATURE ARTICLES

Product improvement an extra—

Break Production Records With Leaded Steels

By T. M. ROHAN, Cleveland Regional Editor

◆ New and improved leaded steels are proving claims for improved machinability right on the production line . . . Increased tap life, higher speeds and feeds, better surface finishes—all are built-in extras that go hand-in-hand with machining the leaded product.

◆ Here's one shop's experience in mass producing a highly critical coupling with a leaded 4640. Savings are spelled out for each operation, and they're considerable . . . Product quality has actually been improved.

◆ LEADED STEELS—despite previous rough sledding—are now gaining in popularity at a remarkable rate. The reason: their excellent machining qualities are helping to roll up new production records.

A typical example of the extraordinary machining properties of leaded steels is to be found at the Axelson Mfg. Co., St. Louis. Machining their product—sucker rod couplings—involves up to 75 pct stock removal. It's a really tough test of relative machinability.

The couplings are not too different from conventional pipe couplings. They have a continuous inside thread and a smooth exterior finish. One requirement is critical, and that is quality.

Here are a few of Axelson's accomplishments in coupling production, thanks to leaded steels:

Without changing existing facilities, production has been increased 25-30 pct.

Tap life has jumped 200 pct, or from 500

FLATS are milled on the couplings in Cincinnati automatic duplex milling machine.

holes per tap to an average 1400 - 1700.

Feed rates are 0.012-0.014 in. per revolution with high speed steel tools.

Machining speeds are up to 185 surface feet per minute.

Savings are about $2500 per month on 25,000 each of carbon and alloy couplings.

The sucker rod couplings produced at Axelson are an integral and highly important part of oil well operations. When oil well pressure is exhausted, the well is put "on the pump" to extract the remainder of the oil.

The long strings of pipe connecting the reciprocating pump at the bottom of the well with the surface are called sucker rods. Couplings are used to string together sections as long as 12,000 ft.

The couplings, measuring 4-4½ in. long, have an internal 10-pitch thread. They are screwed onto a sucker rod and sent to the oil field. There they are strung together with the ends of the rods locking with the ends of the couplings. The pump is then lowered inside the well tubing, and the sucker rods connect it to a surface power unit.

Some wells go down as deep as 12,000 ft. On a 1 in. or 1⅛ in. diam rod, this represents a tensile load of over 30,000 psi. Failure of a coupling frequently requires removal of the two-mile-long string, fishing for the broken end, and reinstallation of the entire string. Production-wise, this is mighty costly. That's why coupling quality is so critical.

Axelson couplings are machined from cold drawn, turned and polished bar stock on Greenlee, six spindle automatics. The inside diameter is drilled halfway, counterbored, chamfered, and the piece cut off—all on a single machine. The piece is then turned end around and magazine fed into another machine which drills clear through the inside diameter, counterbores, and reams. Serial code numbers are stamped on the outside diameter.

The change to leaded steels increased tool life on the automatics by about 50 pct. Production soared 30-35 pct.

Two flats, intended to accommodate wrench jaws, are milled on the coupling's outer diameter in a No. 24 Cincinnati automatic duplex milling machine. Several couplings are mounted on a fixture in a single row, standing vertically. They are moved through two end mills, cutting both flats simultaneously. A better surface finish and freedom from burrs are two advantages credited to milling leaded steels.

The outer diameters of the couplings are centerless ground in a rough and finish pass on a No. 2 Cincinnati centerless grinder. In these operations, results obtained for leaded and lead-free steels are about the same.

After induction case-hardening the outside diameter, the inside diameter is tapped in a Cincinnati Bickford 21 in. drill press. Five machines in a bank are needed to maintain the required production rate. The coupling is held in an air chuck, and the tap is driven by a floating holder.

The tap is a two-step with series of both roughing and finishing threads. When the tap clears the coupling, it falls out of the floating holder and is removed from the chuck when the cycle is completed.

Use of leaded steels has increased tap life phenomenally. From 500 holes with non-leaded stock, a tap now gets from 1400 to 1700 holes per tap, an increase of 200 pct. In addition, production in tapping has increased about 20 pct.

Save $2500 per month

The last machining operation is performed on a special grinder. Face grinding is designed to insure absolute perpendicularity of the coupling end faces with its major axis. The coupling is mounted on a rotating, expanding mandrel. The faces are then brought into contact, one at a time, with the sides of two rotating grinding wheels.

After machining, the couplings are washed and phosphate coated. The coating prevents galling of the threads and also serves as a rust preventive and a base for painting.

With a production schedule of 50,000 couplings per month—divided equally between carbon and alloy—leaded steels are now saving Axelson about $1,100 on alloy steel couplings and about $1,400 on the plain carbon variety.

Leaded steels from Copperweld Steel Co.,

Warren, O., have been used in the operation for three years. Most popular type is 4640, lead treated. The steel is in the annealed, turned, and polished condition. Lead content is 0.15-0.30 pct by weight.

The tripling of tool life with leaded steels at Axelson has a two-fold advantage in lower maintenance cost of the tools themselves and elimination of production loss through downtime for tool changes. The only changes in tooling, in themselves minor, were in angles and types of drills.

Axelson engineers first ran the machines to their limit of 220 surface feet per minute but found that their tools wore out too fast. The advantage of speed was thus lost through downtime for changing tools.

Set record speeds

Rotation speeds were then backed off until 185 sfpm was found to be the optimum speed: wear relationship. (For unleaded steels, rates are generally about 110 sfpm.) Feed rates of 0.012-0.014 per revolution are used. This marks a high for the industry on high speed tools. Higher speeds are obtainable with carbide tools, of course, but on automatics these must be attended.

The first operation of drilling is now completed in 18 seconds compared to 24-25 seconds previously. These figures do not include downtime for tool replacement.

Due to the relatively thin wall and the coarse 10-pitch thread, the couplings tend to expand, when tapped, at the leading threads. The walls of the coupling then have a tendency to close in or squeeze the fine threads of the tap, causing binding. The binding is further aggravated by subsequent induction hardening.

Tap life on regular nonleaded steels was poor due to rapid wear and chipping caused by binding. The improved machinability of leaded steels allows freer cutting and has greatly reduced the binding action. Savings in tap costs alone pay for the extra charged for leaded steels. It is expected that as many as 2000 pieces per tap will soon be possible.

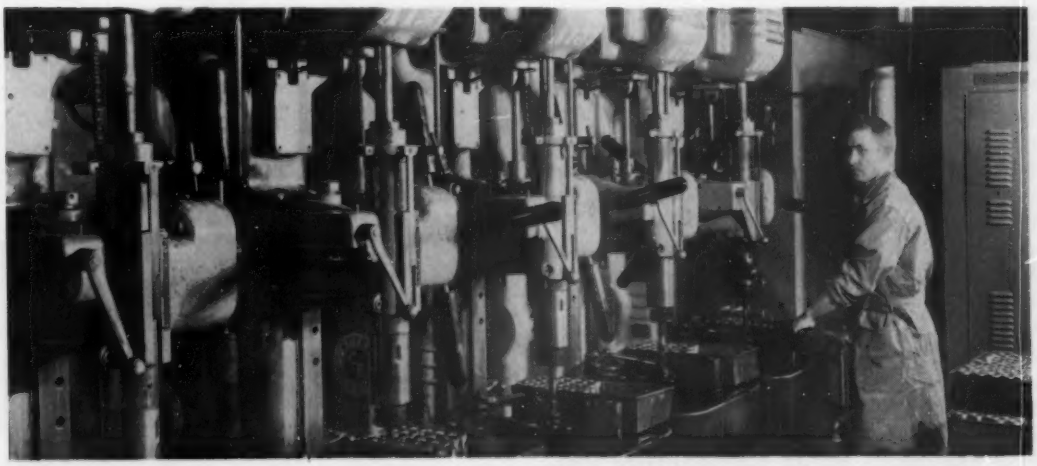
Axelson is of the opinion that leaded steels have also contributed to overall product quality improvement. In the past, fatigue cracks at thread roots were responsible for a number of failures. With leaded steels, there has been considerably less tearing of the threads in tapping. The result has been a smoother thread and less incidence of fatigue cracks.

The small amount of lead has not perceptibly lessened tensile properties, so that strength is unaffected. Axelson's engineers have some evidence that impact properties have actually improved. Test data at this point is still too scanty to be conclusive.

In oil well service, both the corrosion and abrasion resisting properties of the couplings are vital. Alignment must be precise in order to minimize wear and the possibility of buckling. The leaded steel couplings seem to be meeting all of these requirements satisfactorily.

As for the leaded steels, much progress has been made in their manufacture due to improved production methods. A major problem—achieving even distribution of the lead throughout the steel—has been conclusively solved.

Major change from regular steelmaking operations is the addition of reasonably pure and uniformly-sized lead shot to the ingot molds during teeming. Shot size must be under 20 mesh. A special lead shot gun now shoots lead into the molds through a pipe under 90 psi pressure. Rate of flow is calibrated and checked by weight.



PRODUCTION requirements call for the operation of five tapping machines simultaneously.

In mixed lots—

Same Setup Tumble-Deburrs Large and Small Parts

◆ Castings up to 30 in. long deburr in the same equipment handling 2-in. aluminum-clad parts . . . Not simultaneously, not with the same size abrasive, but at least the identical machines.

◆ Such diversity among workpieces forced one metalworker to mixed lot processing, plus a lot of attention to technique . . . Tests found short-run production no barrier to tumble-deburring.

By J. E. ROMAIS, Foreman, Machine Shop,
Santa Monica Div.,
Douglas Aircraft Co., Inc.,
Santa Monica, Calif.

◆ MIXED LOT tumble-deburring can efficiently solve short run finishing problems. Cost-saving aspects of barrel finishing are well known in mass production setups. Much the same situation can hold true in shops where a high proportion of hand finishing now is standard, due to low volume yet diversified production.

Short runs, compared with those of many large metalworkers, are the norm at Santa Monica Div., Douglas Aircraft Co. This plus great diversity in type of material, and its size, shape and contours, previously called for quite sizeable amounts of hand finishing. Part production in its entirety is substantial by aircraft industry standards.

Size of parts deburred encompasses those quite small (e.g., washers) through 30-in. long castings, fully machined to close tolerances. Materials commonly processed include steel, aluminum, magnesium, and even aluminum-clad steel. Batch lots vary in number from only a few to several hundred workpieces, typically 70, 106 or 484 parts.

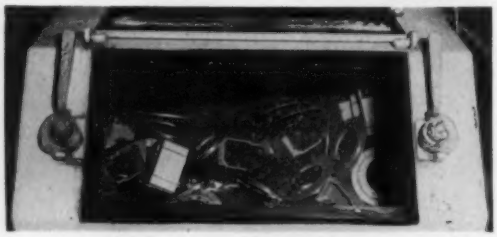
All this points toward handwork, lots of it. The more intricate and larger the part, the more hours are involved. Costs of time-consuming handwork formerly were an important charge against the part, and finally the airplane.

Even more important, delays could hold up production. To top this came difficulty in controlling uniformity on handwork of this kind. On close tolerance work, this could prove costly.

First step in selecting tumbling equipment required a survey of the field. Picking various machines for test followed. Several part vendors then processed sample lots of typical machined parts.

This took place not once, but many times. Final choice of equipment and finishing system devolved to the aircraft inspection personnel. The $14,000 installation includes two double-compartment barrels, one large single-compartment barrel, and a small four-barrel drive unit, all recommended by Speed-D-Burr Corp., Glendale, Calif.

Equipment deburrs not only the varied machine shop production, but also certain punch



TWO LOTS at once are tumble-deburred to maintain production schedules, cut finishing costs.

VARIETY of parts deburred ranges from 30-in. long casting down. For keyed parts, see below.

Typical Costs Of Tumble-Deburred Parts

	Hand Deburr	Tumble Finish	Savings
1	$11.25	$.50	$10.75
2	.20	.02	.18
3	.24	.02	.22
4	.54	.02	.52
5	.15	.02	.13

press products. Parts turned out make up assemblies later in Douglas airliners. Some apply specifically to the aircraft industry. But the majority resemble the diverse workpieces found in any general machine shop, with the possible exception of closer tolerances.

Wet tumbling of machined parts and stampings, the survey disclosed, provides no cure-all for the entirety of shop finishing. About 60 pct of Santa Monica's machined parts can be processed in this way.

Conservatively, its estimated savings in direct labor of tumbling over handwork run 60 pct. This order of savings, carried over a year's production, totals more than 25,000 man-hr. That places dollar savings at more than ten times the installation's cost, a worthwhile return in any industry. Inspection reports are uniformly excellent.

Deburr aluminum-clad parts

All parts in any one barrel must be one metal. Operators do not tumble-deburr fragile parts. Small aluminum-clad workpieces (2-in. cube and smaller) barrel-deburr only if they can complete the process within one hour at low barrel speed (10 rpm). Larger clad parts still must be deburred by hand to preserve clad surfaces.

After referring to the part's setup card for tumbling procedure, operators attach an identity disc to one part of the lot. This enables easy identification following deburring, since more than one order for parts may be run together.

Parts tumble in variously sized Norton triangular, sintered aluminum oxide abrasive. At present, steel media are not employed.

Normal processing starts with loading about half the specified media into the barrel. Parts follow, then a sprinkling of detergent. This aids cutting action and keeps media and parts clean. After loading balance of media atop workpieces, operators add water to make up about 75 pct of available barrel space.

Rpm setting varies with metal processed and part size. After experimentation, top surface speed of 125 fpm has been set.

Roughly, medium size steel parts tumble at 20 to 35 rpm. For nonferrous parts the same size, speed varies between 14 and 24 rpm. Large parts generally tumble slower and longer. Under otherwise equal conditions, metal removal directly reflects tumbling time, hence both can be computed to maintain close tolerances.

At completion of deburring, operators dump load in a sorting pan, and separate parts. At the same time, abrasive media goes through regrading.

Nonferrous parts pass through a hot-rinse, and ferrous parts a cold rinse, before dipping in rust preventive. Hot air blast dries small nonferrous parts. Larger nonferrous parts dry at room temperature.

Small nonferrous parts, it's been found, tend to cling together in the drying process. If not hand-separated, parts tend to discolor and oxidize. A gas-fired sawdust tumbler now on order should eliminate this extra step in processing.

Tough jobs made easy—

Drawn Parts: Save Through Simplified Design

◆ Drawing shells and boxes offers numerous ways to trim costs . . . But many of the cost-saving techniques confine themselves to the shops which develop them . . . Here are production-slanted tips aimed at overcoming some of the tougher problems.

◆ Figuring blank sizes is one of these . . . Formulas have been set up to estimate required blank sizes . . . At the same time, they cut down on costly test runs . . . Even unusual shapes and contours can be handled from a practical shop approach.

By FEDERICO STRASSER, Consultant, Santiago, Chile

◆ DESIGN of drawn parts influences workpiece cost directly, often decisively. Final production cost of a drawn part largely depends on its correct form, shape, contour and dimensional proportions. Dies, equipment and direct labor assume greater significance as cost factors than with flat or simply bent stampings.

Shortcuts exist, and can save time, labor and money. Some given here may apply to your own drawing problems. Value of these tips lies in whether they work for you, in your shop, under actual production conditions. Certainly many can be adapted to suit the individual situation.

Choosing the proper drawing method usually poses the first problem. In drawing boxes and cylindrical shells, three approaches offer themselves: (1) single pass without blankholder, (2) single pass with blankholder, or (3) multiple passes through several intermediate shapes to final contour. The given order reflects normal comparative costs, from lowest to highest.

With cylinders, proportions of inner shell height, mean shell diameter and stock thickness to one another help determine which method best applies. Drawing boxes calls for attention not only to proportions, but also to corner rounding radii. Consider too such secondary factors as equipment available, drawing radii, lubricants, the material and its temper.

Cylindrical shells currently make up more than 95 pct of drawn components. So they can well serve as examples in selecting a drawing method. Table I presents approximate limits within which a simple punch and die arrangement suffices in drawing round shells. Extrapolate or interpolate for values not in the table.

Fig. 1

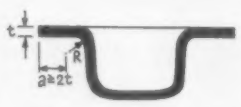
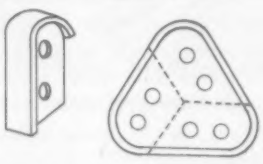


Fig. 2



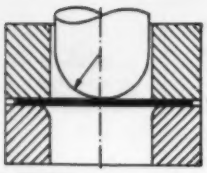


Fig. 3

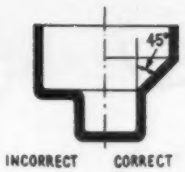


Fig. 4

Beyond these limits, expect to use a blankholder in shell drawing. Heavy reductions most often demand multiple passes, a costly proposition better avoided if possible.

See Table II for information on drawing rectangular boxes without blankholder. Either or both blankholder or multiple pass techniques may be indicated where design requirements exceed table limits.

Both tables assume attention to rounding radii. Regardless of drawing method, make it a practice to enlarge all rounding radii as much as design restrictions permit. This not only cuts drawing stresses, but also production costs.

Control rounding radii

No fixed rules exist for figuring the minimum permissible inner radius at bottom of cylindrical shells. Chief factor is stock thickness, although material, shell shape, diameter and height also enter. Generally, good practice in drawing cylindrical sheet steel shells calls for rounding radii about 8 to 10 times stock thickness. Softer metals (copper, brass, aluminum) normally accept rounding radii 3 to 5 times stock thickness.

Limit rounding radii at flanges to similar values. Flange width measured from center of rounding radius should run no less than twice stock thickness (Fig. 1). This avoids sharp flange edges. If feathered edges do not matter, flange width may be less.

With drawn boxes, rounding radius at corners assumes significance. In a rectangular box, each of the four corner sections may be considered quarter sectors of a round shell, whose diameter is double the corner rounding radius. Remainder of box (bottom and sides) does not participate in the actual drawing process. Since they merely bend, these sections may be largely ignored in determining drawability.

Where corner radii differ in the same workpiece, select the smallest in applying Table II. This corresponds to the most severe conditions met in drawing the box.

When proportions of drawn parts depart from those encompassed in Tables I and II, trouble can start. It's then time to investigate drawing with a blankholder. Production costs increase somewhat with this slightly more complex setup. So consider workpiece redesign, even shifting to another fabrication method, before resorting to blankholders.

The blankholder functions mainly to reduce wrinkling of the part during drawing. Two classes of blankholders are available. They differ principally in the manner of applying pressure. With one group, pressure is relatively constant throughout the press stroke. With the other, holding force varies somewhat.

Hydraulic or pneumatic cushions and double-acting presses provide nearly constant pressure. Compression springs and rubber cushions supply increasing blankholder pressure as the press descends. Some metalworkers favor these last, particularly on short runs, because of lower cost. This cost advantage can offset

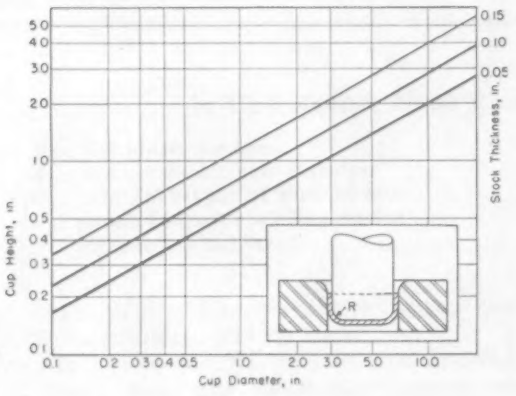


Table I: Drawing Round Shells Without Blankholder (Maximum Dimensions)

FIG. 5 (Below) Calculating Blank Size of Cylindrical Shell

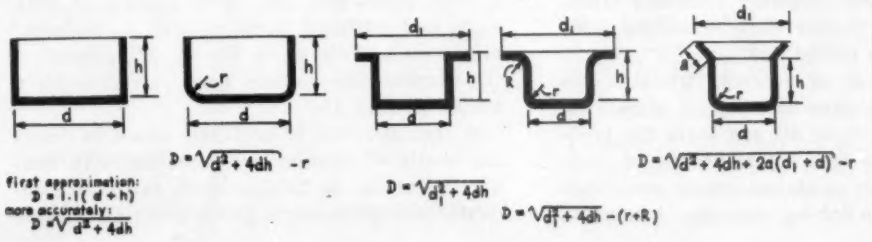


FIG. 6 (Below-Right) Calculating Flat Blank Size of Two-diameter Cylindrical Shell

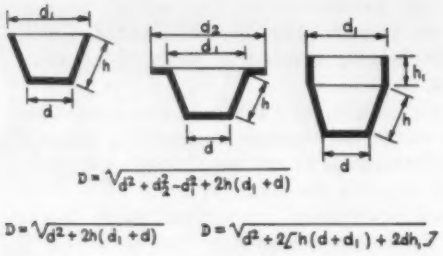


FIG. 7—Calculating Flat Blank Size of Tapered Shell

FIG. 8 (Left) Calculating Flat Blank Size of Half Sphere

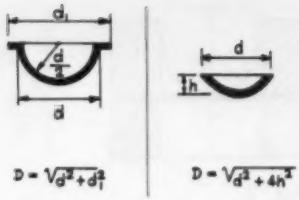


FIG. 9 (Right) Calculating Flat Blank Size of Parabolic Shell

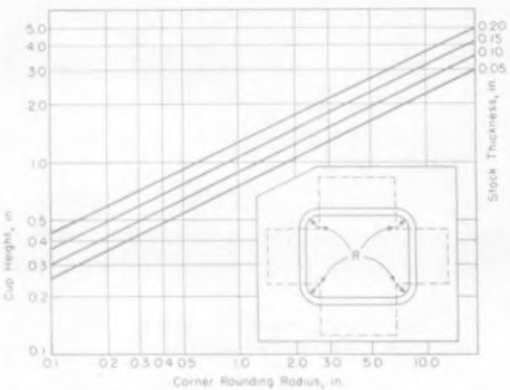


Table II Drawing Rectangular Boxes Without Blankholder (Maximum Dimensions)

drawing restrictions imposed by a variable blankholder pressure.

Class of blankholder helps determine limits of shell depth drawable in one pass from the flat disk. Constant force blankholder setups permit drawing cylindrical shells to a depth very nearly equal to full shell diameter (1:1 ratio). With compression springs and rubber cushions, shell depth drawable in one pass commonly runs less than shell diameter, on the order of a 1.7:1 to 2.2:1 ratio.

Use of blankholding equipment also considerably increases the possible height of rectangular boxes drawn in one pass. For corner radii less than 0.050 in., general practice allows a ratio of 1:6 between corner rounding radius and box height. Corner radii exceeding 0.050 in. permit a ratio nearer 1:4.

For any number of reasons, troubles can crop up in single pass drawing. A simple redesign of workpiece or die can solve the problem. Altering the drawing technique or cycle may help: a faster or slower stroke sometimes works better. Switching drawing lubricants offers still another of many possible answers. (See THE IRON AGE, June 14, 1956, p. 102.)

After investigating more economical solutions (and most often not before), look into multiple pass drawing. The longer the production run, the more likely will this higher cost drawing technique pay off. On shorter runs, almost invariably the economical answer to drawing difficulties lies not in multiple passes. Rather try another fabrication method: spinning, casting, machining or composite construction, for example.

Multiple pass drawing introduces still another cost factor. Work hardening after several draws frequently necessitates an annealing job. This to help reduce internal strains and to restore workpiece ductility.

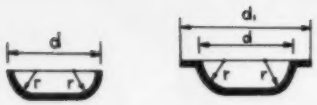
Question of when to anneal involves too many variables for accurate prediction. It is feasible to generalize somewhat. Table III gives approximate values, expressed in percentage reduction permissible between annealing operations. Values apply both to deep drawn shells and boxes.

As the cross sectional area of drawn parts departs from regular geometric shape, production and tooling costs soar. Highest costs usually involve parts of quite unbalanced contours.

Save by Combination

At times, difficulties in drawing highly irregular workpieces can be eased by combining several parts into one. This can occur with right and lefthand parts, as well as identical pieces such as shown in Fig. 2. After drawing the combination as one part, run through a simple slitting die.

A special series of problems arises in drawing shells of circular cross section with nonparallel walls. In this category fall both symmetric and asymmetric shells generally classed



$$D = \sqrt{d_1^2 + 2.28rd - 0.56r^2}$$

$$D = \sqrt{d^2 + 2.28rd - 0.56r^2}$$

FIG. 10—Calculating Flat Blank Size of Flattened Bottom Concave Shell

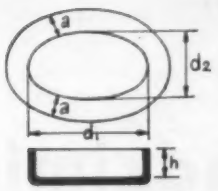


Fig. 11 (Above-Left) Calculating Flat Blank Size of Elliptical Shell

Lay out ellipse corresponding to drawn shell bottom in shape and dimensions. Determine width of ring surrounding by $a = 0.55h + 0.025(d_1 + d_2)$

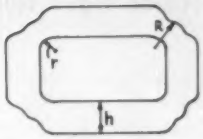


FIG. 12 (Above-Right) Calculating Flat Blank Size of Rectangular Box

Lay out box bottom. Add four sides. Locate centers of corner rounding radii, and draw arcs from each center with radius $R = 1.1r + 0.55h$. Connect arcs to box sides with streamlined lines. With flanged boxes, add flange width (a) and calculate arc radius $R = 1.1r + 0.55h + a$. With tapered rectangular boxes substitute side length b for box height h, and calculate arc radius from $R = 1.1r + 0.55b$.

as truncated cones, half spheres, flattened concave and parabolic shapes. Contrary to the conditions met in drawing cylindrical shells, production costs and troubles in fabricating this class of workpieces usually increase as the ratio between shell depth and diameter diminishes.

In drawing such shapes, the blank can be almost completely out of control throughout the operation (Fig. 3). Thus the ordinary blankholder has difficulty coping with any tendency to wrinkle. Special dies and multiple passes may be the only answer.

Multi-diameter shells can give trouble. To avoid difficulties, design for a smooth, tapering transition section from one diameter to another (Fig. 4). Taper should be near 45°, a standard in redrawing die design.

Avoid too great a dimensional difference between one diameter and that adjacent. Should large and small diameters abut, anticipate need for intermediate drawing steps.

In tooling for this class of circular workpieces, check into blankholder pressure required. Should holding difficulty seem likely, shift to a flanged workpiece. This despite the higher drawing costs accompanying such a design.

By designing the die to bead the flange, blankholding conditions improve substantially. Lower over-all production costs most often quiet protests over added cost of later trimming the bead, if this is indicated.

Correct size and shape of flat blanks destined for drawing cannot be accurately determined before the fact. Actual trial drawings provide the only reliable method. Despite this qualification, formulas given here will simplify figuring blank sizes of most common shapes.

TABLE III

Permissible Reduction In Deep Drawing

Material	Recommended Reduction Between Annealings, pct
Steel	20
Stainless Steel	15–20
Aluminum	20–30
Copper	15–20
Brass	20–25
Zinc	10–15

$$\text{Pct Reduction} = \frac{D - d}{D}$$

D = predrawn shell diam d = redrawn shell diam

In Calculating Blank Size

D = flat blank diameter
d = drawn shell mean diameter
h = internal height of shell of box
r = punch bottom rounding radius (where r < 0.25h)

EDITOR'S NOTE

■ This is the sixth article on stampings in a current series written by Mr. Strasser for THE IRON AGE. Previous subjects and dates: (1) Blanking—March 15, 1956, p. 83; (2) Piercing—April 5, 1956, p. 108; (3) Bending—May 3, 1956, p. 100; (4) Special Bends—June 7, 1956, p. 124; (5) Joining Methods—July 12, 1956, p. 80.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Holds tight tolerances—

New Sendzimir Mill Rolls Extra-Wide Sheet

◆ A king-sized, 52-in. Sendzimir mill is now rolling stainless grades in widths up to 48 in. . . . Combining high capacity with an ability to meet tough specifications, the new mill is holding thickness tolerances to ±3 pct.

◆ Here's one rolling mill's answer to the increasing demand for wider and wider stock . . . Savings to fabricators tie in with extra width, tighter tolerances.

◆ ANY PLANT that can foot the bill can buy itself a new Sendzimir mill—even a king-sized 52-incher. Putting it to work efficiently and profitably to roll top quality stainless sheet is something else again. For the same reasons that a house isn't necessarily a home, it takes more than a piece of equipment to make a well-rounded and successful rolling mill.

The Washington Steel story is esentially an example of how it's done when it's done successfully. With no more than a decade of mill operating experience under its corporative belt, Washington Steel Corp., Washington, Pa., officially unveiled its latest production tool last week—a 52-in. Sendzimir.

Actually, the new mill has been in daily productive use for more than a month. And users of stainless sheet will be glad to know that its performance to date has been exemplary. Stainless sheet is mighty tight nowadays, and Washington Steel supplies about 25 pct of the total light-gage market — almost all of it through warehouse distributors.

Those who know the ins and outs of rolling mill operation may quibble over the performance of a Sendzimir as compared with other types of available equipment. The fact remains that the number of Sendzimir installations has climbed considerably in recent years, and this upward trend shows no signs of slackening. Some of the quality aspects of the Senzimir-rolled product are difficult, if not impossible, to duplicate.

The need for wider mills—such as the 52-incher—is absolutely clearcut. At the present time, the demand for wider sheet continues to increase. At least 50 pct of the total sheet market calls for widths in the 24 in. or wider range.

Forecasts indicate that this demand for the wider product will approach the 70 pct mark in the not-too-distant future. As soon as more equipment for rolling 36 in. and wider becomes available, demand for these widths is calculated to increase proportionately.

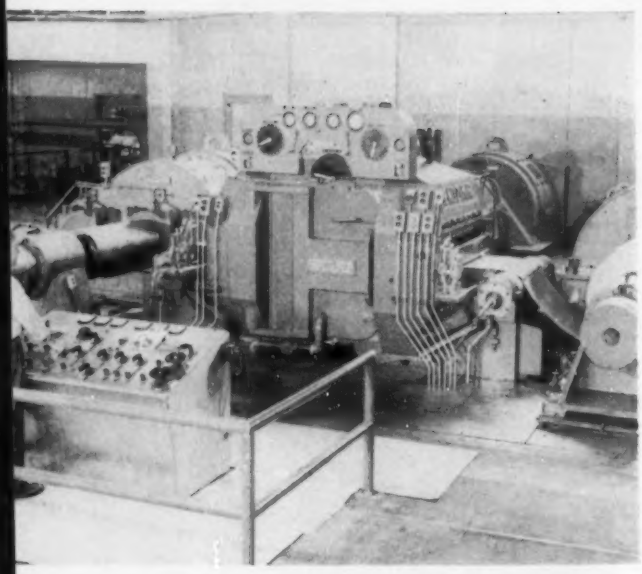
Along with the advantage of increased width, the new mill will produce sheet and strip held to a thickness tolerance as close as plus or minus 3 pct. This extra-tight tolerance has become a Washington Steel standard. From the customer's standpoint, it frequently results in fabricating economies not obtained in sheets rolled by conventional methods.

Give better finish

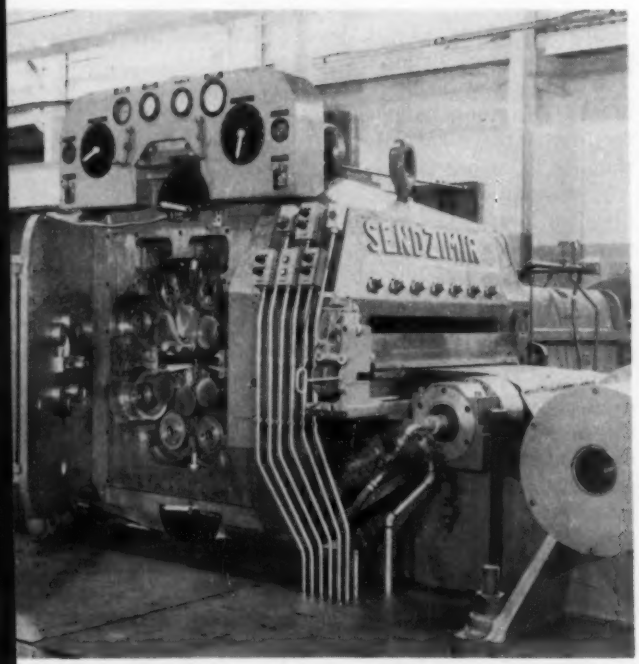
On sheet, the Sendzimirs can produce a cold-rolled finish which drastically reduces extra polishing costs. Depending upon width required, strip thicknesses can be rolled down to 0.005 in. or below.

Typical of the product rolled on the new extra-wide Sendzimir was an order of Type 302 put through the paces this past week. Before the hot rolled coil reached the Sendzimir it was first thoroughly annealed in a gas-fired furnace and chemically pickled. The coil was then rewound and rolled on the Sendzimir mill to gage.

In this particular case, the 302 steel sheet came from the hot mill with a thickness of about 0.125 in. Customer's finished width requirements called for 36¾ in. After a first



ENTIRE mill is operated from remote control panel. Recoiler supplies most of tension in rolling. End-product is held to thickness tolerance that is as low as ±3 pct, thereby providing shop economies.



CLOSE-UP of new Sendzimir mill for rolling extra-wide sheet shows work roll arrangement. Rolls can be made of 12 pct chromium tool steel, high speed, steel, or sintered alloy carbides.

pass on the cold mill, the thickness dropped to about 0.095 in., or a reduction of about 0.030 in.

Seven successive passes followed to produce a finished gage of 0.023 in. Of particular interest is the fact that this entire reduction was accomplished *without* any intermediate anneals. After reduction is completed, a final anneal and cleaning complete the processing cycle.

The 52-in. Sendzimir can conveniently roll sheet up to 48 in. wide in coil form. It has an estimated monthly capacity of 3500 tons. A smaller 39-in. mill handles widths up to 37 in. and is rated at about half the capacity of the larger mill.

Work rolls count

The quality and surface finish of any Sendzimir-rolled product is largely dependent upon the condition of the mill's work rolls. These can be made of a 12 pct chromium die steel, a more alloyed high speed steel, or sintered tungsten-vanadium carbide.

The sintered rolls have extremely high hardness (Rc 78) and can be used to advantage in rolling highly abrasive metals. This same high hardness characteristic also contributes appreciably to the surface quality of the rolled product. And the better the rolled surface finish, the simpler are subsequent polishing operations.

To properly prepare the hot rolled product before and after cold rolling, Washington Steel maintains three separate lines of annealing and pickling facilities. Three gas or oil fired furnaces, ranging from 40 to 50 ft in length, handle annealing operations.

For the annealing of stainless, the furnaces are held at about 2250°F. Coils are fed continuously, and rapid cooling from the solution temperature is accomplished with either forced air or a water quench. Since the hot-rolled coil stock is normally only 0.125 in. thick, forced cooling is not a very critical factor.

Subsequent to annealing, the cleaning and pickling operations are handled, either singly or in combination, by shot blasting machines, electrolytic pickle baths, and hydrofluoric acid tanks. Driers, pinch rolls, shears, and recoilers follow in sequence behind the cleaning and pickling facilities.

In line with customer demand, most of the grades rolled on the Sendzimirs are 300 series stainless. Of the lower alloy grades, Type 430 and some of the newer 200 series grades are beginning to pick up popularity-wise.

A new and highly successful innovation has been the rolling of titanium sheet. Admittedly problematical, the mill's success in handling this material is a credit to its "know how" and the integration of specialized manpower.

Get longer rolls—

Casting Wheel Cakes Copper For Continuous Strip

◆ Orders are increasing for longer sections of continuous rolled and strip copper . . . Fabricating industry, to fill these, has stepped-up demands for larger cakes and billets from refineries.

◆ Formerly confined to ingots, slabs, and wire bars, big copper refinery produces new shapes . . . This is possible due to creation of a $2 million casting wheel . . . Cakes to 4000 lb can now be poured.

◆ LARGER SIZE cakes and billets of refined copper are now requested more frequently than in the past. To meet these demands, the world's largest single producer of refined copper has created a new $2 million vertical casting wheel facility that produces a new copper shape. The wheel is said to enable the copper fabricating industry to produce longer sections of continuous rolled or strip copper and copper foil.

The wheel, now being produced and shipped, according to the Utah Copper Div., Kennecott Copper Corp., allows production of 40 tons per hour of high grade, electrolytically pure copper in cakes weighing 2000 lb. While the wheel is equipped to handle cakes up to 4000 lb, the company has not, as yet, poured that size in regular production runs.

Within a few months, billets of 3 to 4-in. diam are expected to be coming from the same facility in the plant. Heretofore, output was confined to copper ingots, slabs or wire bars.

With addition of these two new shapes, the division, located at Garfield, Utah, will be able to meet copper fabricators' swelling needs for cakes which will go into plates and thin sheets. Also in growing demand are billets for fashioning into tubing through the technique of metal extrusion.

In order to produce these new shapes, it was necessary for the engineers to design and build this unique casting wheel which weighs well over 500 tons. It is said to be the first unit of this nature to have been installed and placed in operation. The wheel rotates around a substantial shaft and is powered by a heavy-duty hydraulic motor.

Its three differences from other casting wheels are primarily these: (1) Molds for billets are attached to the same wheel as are the molds for the cakes. Thus, the dual billet-cake molds on the wheel eliminate mold changing. (2) Simultaneous carrying of 28-cake and 28-billet molds make it larger than other units employed by electrolytic refineries. (3) Instead

VERTICAL casting wheel produces electrolytically pure copper in 2000 lb cakes and 105 lb billets.

NEWLY CAST copper cake is cleaned by a chipper while conveyed from spray chamber.

of full immersion in a water bath to cool the red-hot copper at its 2150°F pouring temperature, a 25-ft cooling chamber with fine water spraying nozzles is used.

The fine spray device is based on the theory that a cloud of steam, generated and surrounding hot metals in a bath, is itself an insulator against rapid temperature drops. This is compared by Kennecott to the way in which the earth's cloud formations protect areas, in part, from a hot sun.

Output 20 tons per hour

Two electric arc furnaces serve the vertical casting wheel. Each of these produce 20 tons of molten copper per hour. Liquid metal flows 55 ft through a launder system or trough to a brick lined ladle holding approximately four tons of metal. Copper pours into one end of the ladle and out of the other to fill casting wheel molds at the same time.

An operator located in an insulated cage, in the middle of the wheel, controls pouring through dual spouts in the ladle. It takes about 3½ minutes to fill both molds. These are previously washed and sprayed with bone ash.

Circulation of water within the mold walls cools them. This feature utilizes an odd-coupling facility and permits flow of water through walls while the wheel is in motion. As the wheel stops to fill new molds, the partially cooled cakes are lowered from the mold by an elevator ejector mechanism. They are then eased onto a conveyor by an automatic arms system and finally passed through the spray chamber. Movement of cakes and/or billets from the wheel, into the spray chamber and thence to the inspection tables, is all geared to the progress of actual pouring and filling of the molds from the ladle.

Chippers, as on slabs, wire bars and ingots, remove any imperfections. Faults may interfere with clean rolling of the cakes into sheets or extrusion of the billets into tubing.

While these cakes may seem small, Kennecott emphasizes that later cakes will weigh up to 4000 lb. Billets, which the company says will shortly go into production, will be three and four in. diam and will weigh in the vicinity of 105 lb each. Eventually, billets up to 9 in. diam and up are expected to be cast.

Looking at the wheel from the economic viewpoint, its importance to domestic copper production is two-fold. First, it enables the company to meet increased customer demands for larger sized cakes and billets. Secondly, it cuts distribution costs to mid-western and western fabricating plants.

Do much research?—

Metallurgical Library Pays Its Own Way

By M. O. BAKER, Baker & Co., Inc., Newark, N. J.

◆ Management doesn't always see eye-to-eye with research, engineering people on the need for a metallurgical library . . . Management must hard-headedly weigh expense against anticipated return, before making decision . . . This takes realistic cost data.

◆ Here's a businesslike approach . . . Based on average needs of 20-man-research-team company, it breaks down initial, operating costs, rates both against cost of present methods . . . Result: a useful guidepost in setting up your own library.

◆ SHOULD we invest in our own metallurgical library?

Management's approach to this problem is of necessity very different from that of research, where such proposals often originate. We need one, the backers argue simply. Our metallurgists and engineers waste too much valuable time, looking up references, making necessary literature searches in unorganized material, sometimes in doing work that has already been recorded—even patented — through being inadequately informed.

But management has to be more hard-headed. It has to go beyond need, weighing it against costs to arrive at a measure of value. Will the returns justify the investment?

There is, of course, no pat answer to fit all companies. But there is a business-like method of setting up yardsticks to measure the expenditures involved, and of figuring what kind of dividends a library will pay.

We'll start by setting up a frame of reference. The research department of a large company in the New York-New Jersey area estimates that it has invested about $40,000 for each technical man in its laboratory. That's for capital equipment and facilities. Each man eats up an additional $20,000 per year in what might be termed running expenses. But offsetting this, they estimate 80 pct of the company's business stems from research.

Since we're considering a small library, we'll figure on a research organization of 20 people. Based on the above, this would come to an original investment of $800,000 and a continuing expense of $400,000 annually. The figure 20 is the maximum number of professionals for whom one librarian and one clerical assistant can provide good library research service.

Charts estimate cost

Overall costs for such a library are estimated in Table I, and Table II breaks down each item. Good grade equipment was selected in each case for real economy.

Location of the library is very important. It must be readily accessible to the people who'll use it most—a central location in the laboratory area is preferable. Working metallurgists aren't dressed for office areas. To locate the research library there is to practically exclude the very people for whom it is intended.

TABLE I

Initial Expense:

Furniture	$2881.00
Books	1700.00
Subscriptions	550.00
Pamphlets	30.00
Miscellaneous supplies	339.00
Total	$5500.00

It's also essential to allow for growth. It's been estimated that a technical library doubles itself every 12 to 15 years, and shelf space may double itself within 8 years unless control is rigid.

One answer to the rapid growth rate is microfilm. It's increasingly possible to get complete files of periodicals, which grow very rapidly, on microfilm or microcards. Some libraries make it a practice to keep periodicals only 3 years after which articles of recurrent interest are put on microfilm and the periodicals sold or discarded. Certain journals are of such lasting value that they are bound or conveniently shelved. Such journals should be made readily accessible.

Allowable floor load is another important consideration. A stack of books seven shelves high weighs 140 lb per ft, plus the weight of the stacks and a safety margin. Other considerations are lighting (40 to 60 foot candles of shadowless light is desirable for reading), ventilation and the need for quiet surroundings.

From the tables, it'll take a total of $5500 to equip the library. Annual running costs, estimated in Table III, will come to an additional $11,600. It's wise to give your librarian discretionary powers in shifting some of the money apportioned from one item to another, as long as the total remains constant.

The reason for assigning a rather generous allowance to the "miscellaneous" category is to allow for small purchases. Need for these will arise easily in a new department.

TABLE II

Breakdown Of Furniture Costs:

Librarian's desk	$145.00
Secretary's desk	155.00
(2) Typewriters	395.00
(2) Typists chairs	74.00
Typing stand	32.50
Two door steel supply cabinet	50.00
Charging Table	30.00
12 Tiers of glass front bookcases (5 sections high)	930.00
3 Four drawer steel vertical files @ $48.00 ea	144.00
Small steel cabinet (10 drawers and shelves)	42.00
Table (25" x 18")	20.00
2 Steel reading tables	144.00
2 Tables for carrels	120.00
5 Tiers of steel stacks (7 shelves high)	250.00
1 Book Truck	50.00
1 Ladder (on castors)	50.00
(4) Chairs	130.00
(2) Chairs	89.00
	$2850.50

TABLE III

Annual Operating Expenses:

Depreciation	$550.00
Salaries	8120.00
Books	1250.00
Binding	200.00
Subscriptions	550.00
Supplies	250.00
Photostats	150.00
Miscrofilm	.....
Pamphlets	.....
Travel	300.00
Miscellaneous, Postage, Telephone, etc.,	230.00
	$11,600.00

Why have a professional librarian? Companies planning their first library often ask this question, since a professional librarian's salary is apt to be the largest single item in the budget. The company could save more than $1500 a year by putting a competent clerk in charge. Why pay out the extra money?

First, a professional librarian brings in the wide scattering of books, periodicals, reports and other printed matter already spread around the company, and will organize and catalog these in a central location. Cataloguing cuts down considerably on searching time. Books are grouped together on shelves so that all information on a given subject, investment casting for instance, will be found together.

This requires system. Each book is assigned a number or a combination numerical and alphabetical designation to indicate its position on the shelves. It's difficult to judge subject matter by title alone in assigning numbers since titles are often very misleading.

A subject file of index cards, with cross reference guides where necessary, is set up to further aid the searcher. A master subject heading list must be compiled to do this efficiently. This list is really the key to the li-

TABLE IV

Cost of Library Time vs Laboratory Time

Method	Ratio (hours spent)	Cost of Librarian ($2.50 per hr.)	Cost of Scientist ($3.65 per hr.)
1. Card index vs hit-or-miss search	1 to 5	$2.50	$18.25
2. Shelf arrangement vs unorganized material	1 to 3	2.50	10.95
3. Answers on telephone vs looking them up	1 to 10	2.50	36.50
4. Literature searches	1 to 1½	2.50	5.47
	Total	$10.00	$71.17

brary, and for a company's special library must be compiled specifically for the people of that particular company. This means knowing what types of information the library's users will seek, and the terminology they'll use.

All transactions, periodicals and pamphlets will be catalogued. Searchers for information on any prime interest of the company will be able simply to pull out a file drawer and find virtually all the company's holdings on that particular subject. It's easy to imagine how many hours of hunting out items this will save.

With material on hand arranged and catalogued, the librarian will perform his second major function—that of starting the program for acquiring new materials. He'll do this by consulting the people he serves, then drawing up a list of books and periodicals that should be in the library. Within the bounds of the budget and the main interests of the organization he'll then build up a highly specialized collection.

Borrows marginal material

For help in this, he'll follow announcements of books, theses, periodicals, symposia and government reports of this and other countries. His service here is not only in what he acquires, but in what he eliminates.

He'll perform a third function. In a special library, it's inevitable that a need will arise from time to time for information on subjects quite foreign to the usual interests of the organization. The professional librarian knows where to obtain such material on loan, by photostat or micro-reproduction—and he has the contacts to do it. If the question is specific enough, he often gets the answer by 'phone.

There are other important services a librarian can render. He can himself answer specific questions on the telephone. He can do literature searches, establishing for the scientist what has already been published on a subject and what has been developed in closely related fields. He can keep his people informed by watching periodicals and book announcements, and routing marked items of interest to people who might have missed them.

These are just some of the tasks which suggest the need for professional training.

Since our approach is mainly a financial one, let's turn to Table IV. Based on careful estimates made by librarians and laboratory personnel of several organizations, this establishes the relative cost of having the librarian do the job vs letting the scientist seek out his own information unaided.

Ratios are based on the librarian's salary of about $5000 as against the scientist's salary averaging out to $7550. What it all adds up to, on the basis of 4 hours' time spent, is a salary expenditure of $10 for library time against $71.17 for lab time.

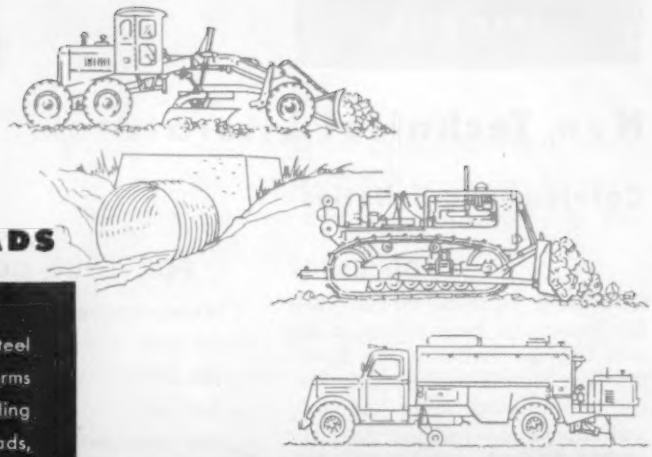
In addition, hiring a competent librarian results in direct savings in two other areas: that of organized purchasing vs independent buying by individuals, and that of borrowing by the librarian through professional contacts vs buying the same material. Figuring discounts and comparative time involved, the librarian will realize an additional $1535 value received here for the total of $1700 budgeted for books each year.

Of course, it's true that research personnel might not buy the material which the librarian, were he there, could borrow. But it's also true that doing without the needed material might well represent a serious loss which could not be estimated in dollars and cents. It's unthinkable that men doing active and important research should be denied the information they need.

There's another highly important intangible which cannot be overlooked. A good library is a sales point in attracting high-caliber scientific personnel. Naturally, able men prefer to work in well equipped laboratories—and good library service is generally considered an important part of that equipment. Very often letters inviting a professional person to join a staff will say, "and we have an excellent metallurgical library."

Newport Steel

HELPS BUILD ROADS



Substantial tonnages of Newport steel products go into equipment that performs road building miracles under grueling conditions. In many instances these roads, which must withstand the pounding of incessant traffic, are drained by culverts made by Newport Steel. Yet these are but indications of the versatility of the Newport products listed below. Conveniently situated in the heart of America's greatest industrial growth, this 70-year-old company employs highly skilled steelmakers and the most modern facilities to produce fine steels to the exact specifications of leading industries.

PRODUCTS OF
NEWPORT STEEL

Cold-Rolled Sheets
Hot-Rolled Steel in Coil
Hot-Rolled Pickled Steel in Coil
Hot-Rolled Sheets
Hot-Rolled Pickled Sheets
Electrical Sheets
Alloy Sheets and Plates
Electric Weld Line Pipe
Eave Trough and Conductor Pipe
Culverts

ECONOMICAL WATERAIL-TRUCK DELIVERY

Newport Steel is ideally situated on the Mississippi-Ohio River system and the great Cincinnati rail-truck hub. New barge facilities, 7 major railroads and 143 motor carriers enable Newport to give economical, dependable delivery to the entire area of the Middle West and South.

Newport Steel

CORPORATION

NEWPORT, KENTUCKY

YOUR CONFIDENCE IS JUSTIFIED WHERE THIS FLAG FLIES

A SUBSIDIARY OF MERRITT-CHAPMAN & SCOTT CORPORATION

FREE AIDS

New Technical Literature:

Catalogs and Bulletins

Die heads

Generating accurate threads calls for proper die head design, a recent 12-page booklet states. Specifications for die heads fitting turret lathes, hand screw machines and automatic screw machines are given. Booklet also tells of features tending to assure long and efficient die head life. *Landis Machine Co.*

For free copy circle No. 1 on postcard, p. 105

Dust collector

New venturi tube for wet collection of industrial dusts is illustrated and described in an 8-page brochure just offered. Fifteen photographs and drawings show the action of the venturi. Three tables present dimensions, weights and capacities. Utilizing the venturi tube, text states, water breaks into fine particles mixes with dust-laden air without mechanical means. Dust entrapped in water particles settles to the bottom of a tank. *Pangborn Corp.*

For free copy circle No. 2 on postcard, p. 105

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 105.

Ultraviolet radiation

How to use ultraviolet light in inspection and production is detailed in a leaflet now available. In inspection, defects in painted dial numerals, and surfaces of other coatings are described, as well as cracks found by the fluorescent penetrant method. *Ultraviolet Products, Inc.*

For free copy circle No. 3 on postcard, p. 105

Rotary grinders

New rotary grinders are described in colorful catalog just released. Bulletin includes photographs of circular grinding machines with description and location of controls plus other features and complete specifications. Ways to save grinding time are itemized. *Thompson Grinder Co.*

For free copy circle No. 4 on postcard, p. 105

Heat exchangers

Literature on sectional heat exchangers, illustrates and explains functions of equipment. Text explains how exchangers help cool liquids in industrial plants independent of a large supply of cooling water. Reasons why savings of installation and operating expenses can be expected are covered. *Niagara Blower Co.*

For free copy circle No. 5 on postcard, p. 105

Aerial cable

New booklet on aerial cable for electric utility and industrial power distribution systems has been announced. It gives complete data and product data on aerial cables of all types—preassembled, preassembled reverse-lay, field assembled and messenger and ring type. Text discusses application of aerial cable, and when to use aluminum conductors. Also included are comparative costs of aerial versus open wire installations. *Construction Materials Div., General Electric*

For free copy circle No. 6 on postcard, p. 105

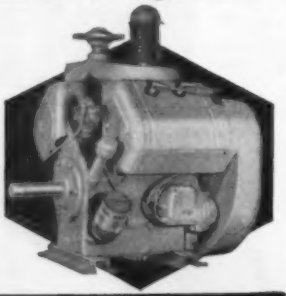
Your CUSTOMERS CAN GET SERVICE
whoever they are...
wherever they are...
for
WISCONSIN
HEAVY-DUTY
Air-Cooled
ENGINES

Parts and service supplied by more than 2200 dealers in the United States, Canada and in 82 foreign lands

In addition, traveling service clinics enable dealers and their mechanics to keep up to date on latest industry practices and on Wisconsin service techniques . . . including complete instructions on preventive maintenance to keep Wisconsin engines operating at top efficiency year after year . . . indefinitely.

Just a couple of more good reasons why it pays to specify Wisconsin Heavy-Duty Air-Cooled Engines for your equipment.

Write for Engine Specifications Bulletin S-188, and a copy of our complete list of approved service stations throughout the world.



WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

A 8751-1/3A

Automatic lubricators

One pint automatic lubricators, actuated by the machine they service, are described in a service instruction leaflet now offered. Lubricators are used on a wide range of machine toool equipment. Separate sections discuss maintenance, service, operation and "starting a new machine." Four specification tables give details for flexible hose, tubing, compression fittings and junctions used in lubrication systems. With a range of built-in reduction gears, they are driven by the machine on which used or can be driven by a small motor. *Bijur Lubricating Corp.*

For free copy circle No. 7 on postcard, p. 105

Hydraulic cylinders

High pressure hydraulic cylinders for 2000 psi service are described in a 12-page catalog recently released. Catalog contains detailed engineering and dimensional data in easy-to-use form. It describes cylinder features and shows part cross-sections, mounting brackets, rod clevises, and special designs. *Galland-Henning Nopak Div.*

For free copy circle No. 8 on postcard, p. 105

Forged rings

Production of seamless forged and rolled rings 1-145 in. diam. is covered in a 16-page bulletin newly printed. Illustrated booklet details steelmaking experience and offers services to those with specific steel-machining problems. Information on calculating ring weight and typical applications spell out advantages of using quality steels. *Alco Products, Inc.*

For free copy circle No. 9 on postcard, p. 105

Limit switch

New service bulletin now available, describes rotary cam limit switch for mechanical presses. Limit switch features fast external adjustment of the cams while the press is in operation. Press need not be stopped while adjusting timing of either press controls or auxillary equipment. Text explains and illustrates reasons for this. *Danly Machine Specialties, Inc.*

For free copy circle No. 10 on postcard, p. 105

RANSBURG
Electro-Spray
DOES IT BETTER... FOR LESS

Look what Ransburg Electrostatic Spray painting is doing in this eastern job shop, the Del-Val Finishers Division of J. W. Rex Company, Lansdale, Pa.

As a job shop, Del-Val handles a variety of work each month, painting hundreds of thousands of pieces and parts of various sizes and shapes.

The versatility and flexibility of Ransburg Electro-Spray makes it ideal for their varied painting requirements. Here's a typical example. Del-Val recently completed a contract for a Philadelphia manufacturer of barbecue trays with these results:

50% INCREASE IN PRODUCTION

50% SAVINGS IN LABOR and OVERHEAD

66% CUT IN PAINT COSTS, with improved, more uniform, and higher quality finish.

The job—flat sheet steel, 11" x 19"—enamel coated to withstand a 90 bend with sharp radius. Full coat one side; mist coat other.

WITH RANSBURG ELECTRO-SPRAY		BY FORMER HAND SPRAY	
Output, 375 panels per hour with 3 men		Output, 250 panels per hour with 4 men	
	per panel		per panel
Labor and overhead	.06	Labor and overhead	.12
Paint & lease cost	.017	Paint cost	.044
TOTAL COST	.077	TOTAL COST	.164

Want to know what Ransburg Electro-Spray can do for you in YOUR finishing department? Write for our new No. 2 Process brochure. It tells the WHAT & HOW of electrostatic spray painting, and with numerous production-line examples, shows how other manufacturers are cutting finishing costs... increasing production, and improving the quality of their work with Ransburg equipment. Too, we have available now a new movie, "The Big Attraction," a 27-minute sound and color film on electrostatic spray painting.

Ransburg ELECTRO-COATING CORP.
Indianapolis 7, Indiana

RANSBURG

say, see the new **miller** *SRH low-boy?*

Where floor space is a problem — or where stacking and paralleling is indicated — the new Miller SRH LOWBOY is the engineered-to-your-needs answer! This dc rectifier type welder is available in three models with 60% duty cycle ratings of 200, 300 and 400 amperes. Combining compactness with quiet operation, minimum arc blow, top electrical efficiency and waterproof construction, the LOWBOY is *another* Miller first that "figures."

Upright SR models to 600 amperes at 40 volts with 750 amperes maximum output; Duplex units up to 1200 amperes, 40 volts, 1500 amperes maximum.

"... if it's MILLER you know it's the finest..."

New

MILLER ARCWELD welding electrodes are worthy of the MILLER name and reputation. Ask your distributor for some ... you'll *like* the job they do.

miller

ELECTRIC MANUFACTURING CO., INC.

APPLETON, WISCONSIN

Distributed in Canada by

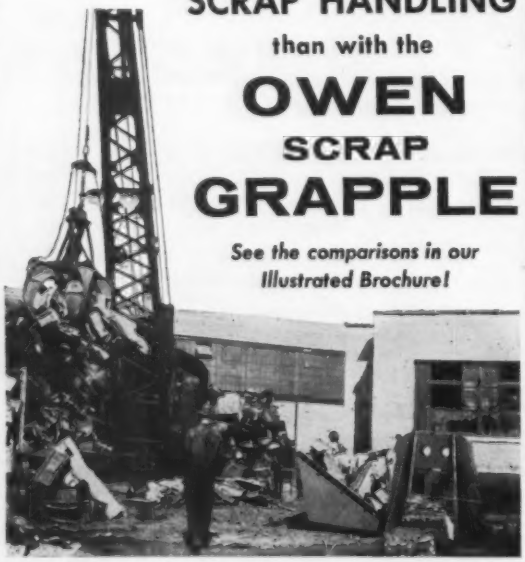
CANADIAN LIQUID AIR CO., LTD.,

MONTREAL, P.Q.

There's No Better Way for EFFICIENT ... ECONOMICAL SCRAP HANDLING than with the

OWEN SCRAP GRAPPLE

See the comparisons in our Illustrated Brochure!



The OWEN BUCKET CO. • BREAKWATER AVE. • CLEVELAND 2, OHIO

Branches: New York, Philadelphia, Chicago, Berkeley, Calif., Ft. Lauderdale, Fla.

Manufacturers of OWEN CLAMSHELL BUCKETS

C — ACRT CAST

ELECTRIC FURNACE

STEEL CASTINGS

CARBON • ALLOY • STAINLESS

SAND OR SHELL MOLDED

"C" Steel Castings—sand or shell molded—possess qualities far more interesting than the mere strength of steel. For, in addition to strength they provide more efficient design—better weight-strength ratio—and greater fatigue resistance, i.e., longer life and less replacement. Furthermore "C" Steel Castings, because they are truly foundry engineered from pattern to final casting, require minimum machining and provide better fit plus fast assembly.

If you are interested in castings, the know-how, experience and engineering knowledge of our staff are at your service upon request.

CRUCIBLE STEEL CASTING CO.

LANSDOWNE 1, PENNA.

FREE TECHNICAL LITERATURE

Paint pump

Literature describes technique and equipment for production painting without pouring paint from original container. Paint pump features and its uses are covered, with details on how this coating setup will save on handling, downtime and labor. Suggested hookups in clear illustrations show how best to employ paint-from-container-techniques. *The DeVilbiss Co.*

For free copy circle No. 11 on postcard, p. 105

Injection molders

New eight page bulletin describes operating features of vertical injection molding machines, available in capacities from 1-24 oz. Bulletin also describes claimed advantages of the vertical method of injection molding and includes complete information on machine specifications and physical dimensions. *Watson-Stillman Press Div., Farrel-Birmingham Co., Inc.*

For free copy circle No. 12 on postcard, p. 105

Resistor Guide

Comprehensive data on resistors and special products is listed in revised 1956-1957 Official Resistor Engineering Guide. Data given includes JAN or MIL equivalent, rated wattage, standard tolerances, Temperature rise, temperature coefficient, maximum operating temperature, ohmic values available, dimensions and approximate prices. *International Resistance Co.*

For free copy circle No. 13 on postcard, p. 105

Gearmotors

Development of a line of right-angle, single-worm reduction gearmotors is explained in a new bulletin. Available in ratings from ½ to 30 hp, ac or dc, a wide variety of motor types and enclosures are said to adapt these units to practically any service requirement. *Elliott Co.*

For free copy circle No. 14 on postcard, p. 105

Strip machine

Four-page bulletin explains the Stationmaster, a two-station indexing type jolt, squeeze, strip machine which can be controlled automatically or semi-automatically. *Herman Pneumatic Machine Co.*

For free copy circle No. 15 on postcard, p. 105

When you buy *Acme-Gridley*
you get **SERVICE**
ANYTIME, ANYWHERE

Within minutes of an urgent call for help, three Namco servicemen were on their way to this Connecticut plant.

Service without delay prevented extensive exposure damage, returned machines to production sooner.

Consider the importance of such "help-when-you-need-it" the next time you purchase automatic bar or chucking machines.

National Acme

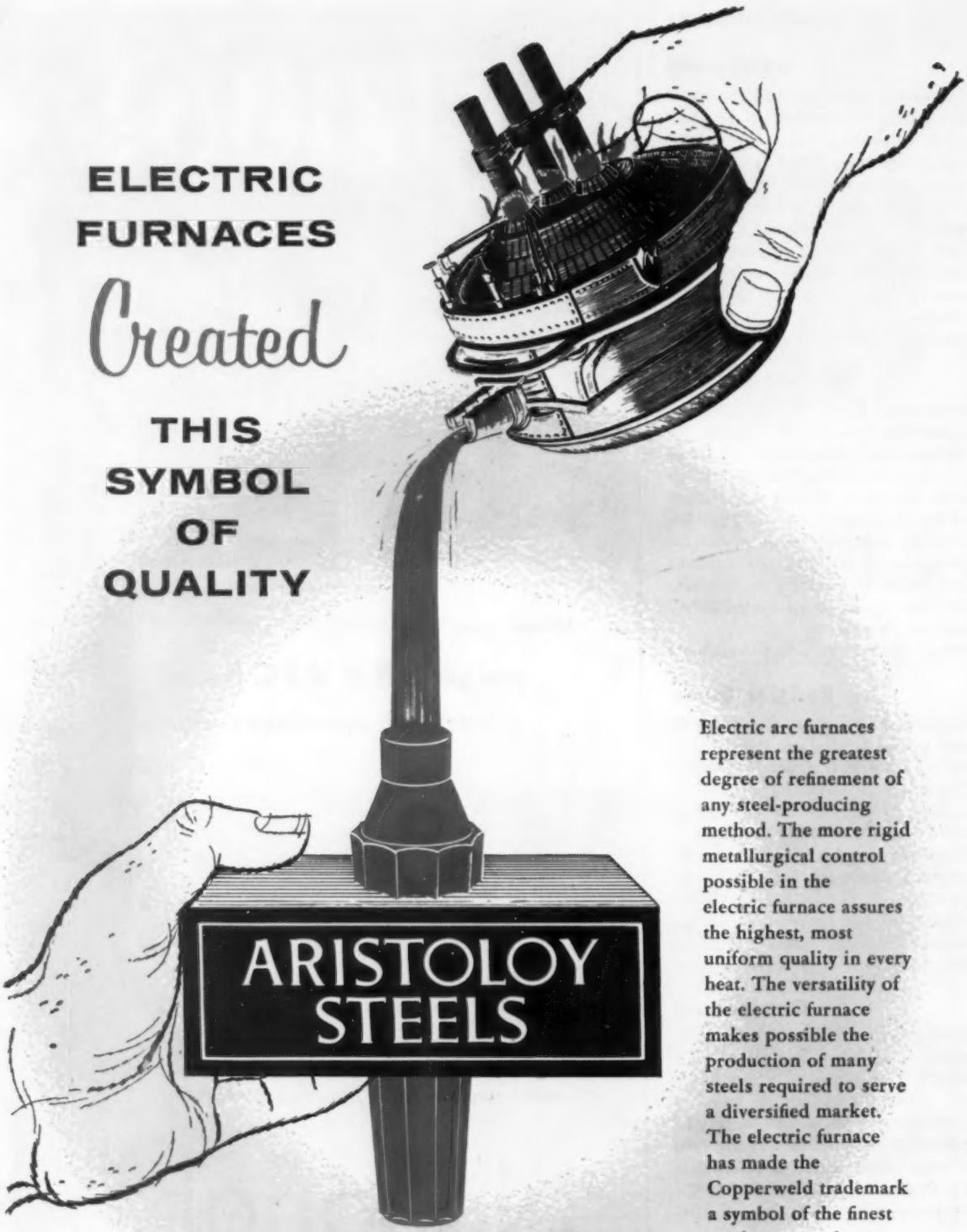
The NAMCO nameplate on your machine assures service — in emergency or normal situations — when and where you need it.

THE NATIONAL ACME COMPANY • 175 East 131st Street, Cleveland 8, Ohio

ELECTRIC FURNACES

Created

THIS SYMBOL OF QUALITY



Electric arc furnaces represent the greatest degree of refinement of any steel-producing method. The more rigid metallurgical control possible in the electric furnace assures the highest, most uniform quality in every heat. The versatility of the electric furnace makes possible the production of many steels required to serve a diversified market. The electric furnace has made the Copperweld trademark a symbol of the finest steels you can buy.

STANDARD STRUCTURAL ALLOY • BEARING QUALITY • ALLOY TOOL • NITRALLOY • CARBON TOOL • SPECIALTY • MAGNAFLUX-AIRCRAFT QUALITY

Hot Rolled • Forged • Annealed • Heat Treated • Normalized
Straightened • Cold Drawn • Machine Turned • Centerless Ground

COPPERWELD STEEL COMPANY • STEEL DIVISION • WARREN, OHIO

EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N. Y.

FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 100.

Forge furnace

Features of automatic forge furnace are described in new booklet stressing shop approach to forging operations. Need for controlled heat, particularly in cold shank forging, is explained, as are design details of the furnace achieving this. Makers state the furnace handles all tool forging and hardening requirements. *Furnace Div., Delaware Tool Steel Corp.*

For free copy circle No. 16 on postcard

Barrel finishing

New folder is designed to give metal fabricators an over-all view of problems and requirements in barrel finishing. Subject is discussed from precleaning to final rinse. Leaflet describes actual in-shop experience in use of cutting and descaling solutions, picking the right finishing materials, alkaline vs. acid type compounds, burnishing solutions, water levels, and media-to-work ratios. Folder also discusses barrel finishing materials recommended for various procedures. *Oakite Products, Inc.*

For free copy circle No. 17 on postcard

Self-lapping valves

New bulletins announce a line of shut-off valves for control of oil from 0 to 3000 psi and air from 0 to 2000 psi. Valves are said to withstand velocities up to 60 fps without modification. Devices incorporate a pressure-balanced, self-aligning tubular sealing ring to control critical leakage, text says. Seal reportedly wipes the rotor clean with each actuation. *Barksdale Valves.*

For free copy circle No. 18 on postcard

Aluminum corrosion

New 72-page technical booklet analyzes corrosion behavior of wrought aluminum alloys. Brochure makes extensive use of engineering data and formulae in describing typical form of corrosion and their effect on aluminum and aluminum alloys. Factors accelerating the corrosion of aluminum alloys are discussed, along with design methods to control them. Booklet also evaluates various aluminum alloys from a corrosion standpoint. *Kaiser Aluminum & Chemical Corp.*

For free copy circle No. 19 on postcard

Diecasting machine

Four-page leaflet describes diecasting machine designed for attaining and holding high pressures. Denser castings, longer die life, easy operation are reported with casting pressures to 40,000 psi. Locking wedges help achieve these pressures in cold chamber diecasting of aluminum, magnesium and brass. *Cuyahoga Industries.*

For free copy circle No. 20 on postcard

Friction drives

Latest issue of *Production Road* tells the story of American highway progress, and needs to keep ahead of the increasing traffic. The article includes a short resume of our present highway situation. Other timely articles include latest information on friction and fluid drives for industrial applications. The magazine also includes tips on efficient use of these drives. *Twin Disc Clutch Co.*

For free copy circle No. 21 on postcard

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 8/2/56

Circle numbers for Free Technical Literature or Information on New Equipment.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

If you want more details on products advertised in this issue fill in below:

Page .....Product .....

Page .....Product .....

Page .....Product .....

Your Name .....

Title .....

Company .....

Co. Address .....

City ..... Zone .....

State .....

FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) New York, N. Y.

BUSINESS REPLY CARD

No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE

Post Office Box 77

Village Station

NEW YORK 14, N. Y.

Blind rivet gun

Folder describes a new gun, designed to set all lengths and diameters of aluminum, steel or monel blind rivets. Riveter is designed for use with either electric or pneumatic powered drills. Recommendations for drill motors and pull heads are included. *Townsend Co.*

For free copy circle No. 22 on postcard

Pressure pipe

Guide to installing pressure pipe for overhead industrial water and process lines now is available. The 48-page text, divided into 15 sections, covers such items as hanging and supporting the pipe, bracing for thrusts, the poured flange coupling and the flange coupling. It also lists suppliers of fittings, accessories and couplings. Guide includes diagrams of typical systems for overhead lines, plus more than 50 illustrations. *Johns-Manville.*

For free copy circle No. 23 on postcard

Self-sealing rivets

Containing complete data on fluid-tight rivets, a new six-page brochure offers technical descriptions, photographs and charts of the self-sealing rivet principle. Seal is achieved without use of caulking or rubber-sealing agents. Shear strength test values are listed, along with actual tables and photos defining fatigue and surge pressure tests. Quality control and inspection procedures are accurately described. *Pastushin Industries, Inc.*

For free copy circle No. 24 on postcard

Low fork lift

Four-page bulletin contains complete specifications and drawings of low-profile electric-driven fork lift truck. This 68-in. high truck, it's said, is suitable for use where low overhead clearances pose problems. Operator sits 34 in. from the floor, his head well below mast height, an important safety feature. Truck lifts 3000 lb with up to a 48-in. long load. *Automatic Transportation Co.*

For free copy circle No. 25 on postcard

Automatic millers

Concepts claimed new to bed type production milling are described in a 10-page bulletin now available. Text and illustrations cover series of plain and duplex milling machines, including features and typical automatic table feed cycles. Specifications of eight models are detailed. *The Motch & Merryweather Machinery Co.*

For free copy circle No. 26 on postcard

Pressure tubing

Metalworkers involved with heat transfer equipment may appreciate a four-page technical folder just released. Intended to furnish data on using tubing at elevated temperatures, the bulletin covers mechanical and physical properties of seamless and welded carbon steel pressure tubing. It also supplies helpful information on fabricating operations normally performed on such tubing. *Babcock & Wilcox Co.*

For free copy circle No. 27 on postcard

Large OD tubing

First literature, it's claimed, on large diameter thin-wall tubing now is available. Five-page bulletin describes tubing from ⅝ to 2½ in. OD and wall thickness of .035 in. and less. Data points out that large OD thin-wall tubing can answer many design problems. These include need for such properties as light weight, good heat transfer, close tolerances, ductility and bright, clean OD and ID surfaces. *Superior Tube Co.*

For free copy circle No. 28 on postcard

Handling equipment

New catalog just issued illustrates and describes typical production applications of automatic press unloading machines. Catalog includes information on overhead, portable turnover and transfer equipment, as well as other unloading machines used both by mass production industries and job shops. In addition, various types of gripping jaws that adapt to a wide variety of unloading conditions are illustrated and described. *Sahlin Engineering Co., Inc.*

For free copy circle No. 29 on postcard

BUSINESS REPLY CARD

No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE

Post Office Box 77

Village Station

NEW YORK 14, N. Y.

FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) New York, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **8/2/56**

Circle numbers for Free Technical Literature or Information on New Equipment.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

If you want more details on products advertised in this issue fill in below:

Page .....Product .....

Page .....Product .....

Page .....Product .....

Your Name .....

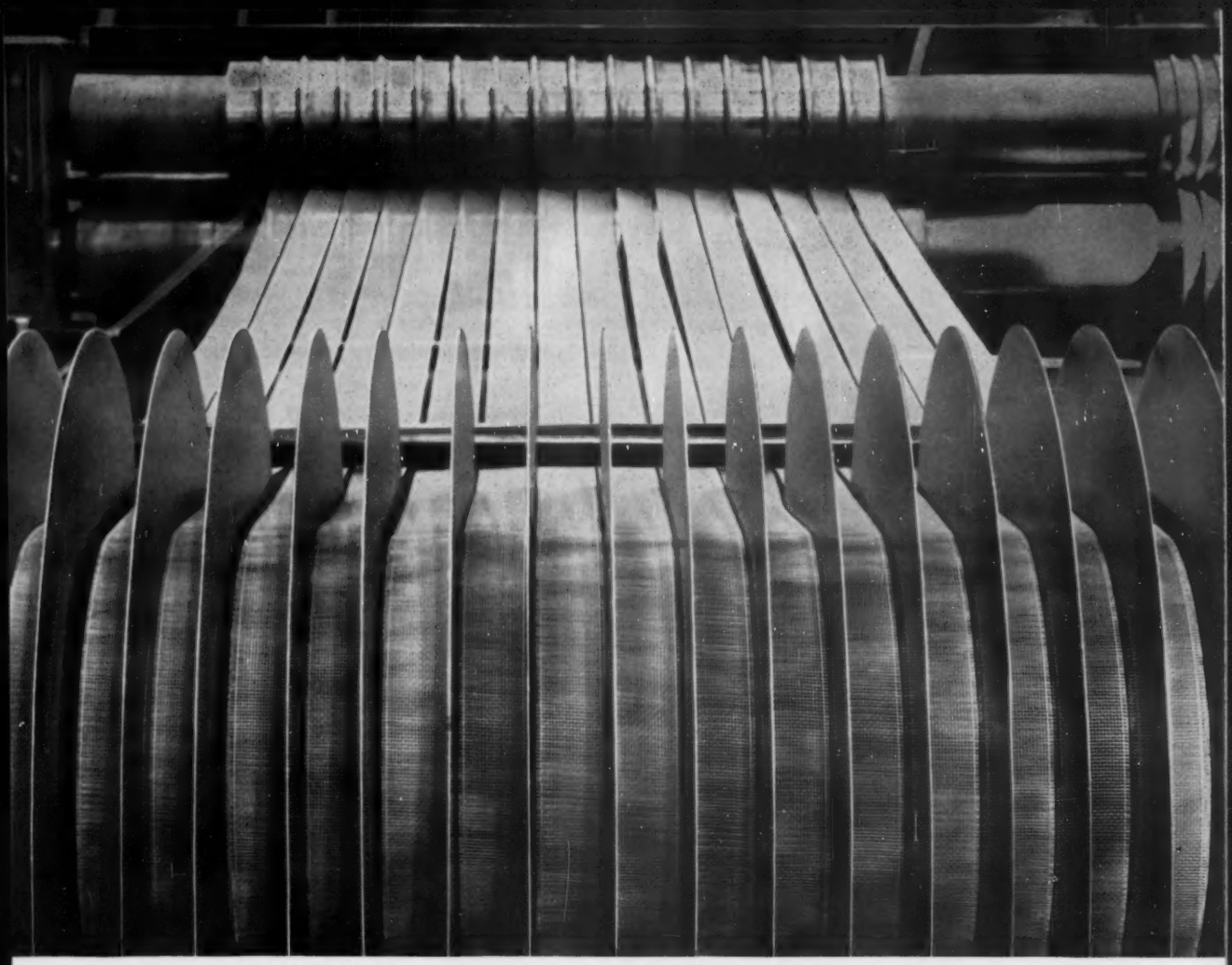
Title .....

Company .....

Co. Address .....

City ..... Zone .....

State .....



HOW WE GO TO ANY LENGTH...OR WIDTH...
to help you save money on wire cloth components!

● Wire cloth users are experiencing a couple of new reasons why it pays to do business with the Reynolds Wire Division of National-Standard.

Here's the idea. . . .

In blanking or forming wire cloth components, a roll of wire cloth 2 to 8 times normal length means 2 to 8 times as much production in a single run without a shutdown. It also means less waste and less handling!

Similarly, when cloth is pre-slit (as shown above) to exactly the width a customer really needs, this too results in less waste, faster production and reduced handling.

So these days Reynolds Wire is departing more and more from old established industry standards . . . producing wire cloth in continuous lengths up to 800 feet instead of standard 100-foot rolls . . . and furnishing pre-slit cloth as narrow as 1 inch wide and even less.

Why not talk with Reynolds about your wire cloth needs? If we can help you cut production costs you'll be ahead on *every* count... for there's no better, more uniform wire cloth than that you can get from Reynolds. Try us.

NATIONAL-STANDARD COMPANY • NILES, MICHIGAN
Tire Wire, Stainless, Fabricated Braids and Tape

ATHENIA STEEL DIVISION • CLIFTON, N. J.
Flat, High Carbon, Cold Rolled Spring Steel

REYNOLDS WIRE DIVISION • DIXON, ILLINOIS
Industrial Wire Cloth

NS
NATIONAL-STANDARD
Company
NILES, MICHIGAN

WAGNER LITHO MACHINERY • JERSEY CITY, N. J.
Special Machinery for Metal Decorating

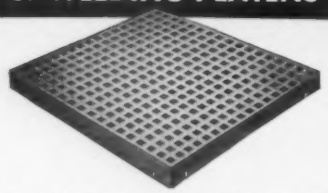
WORCESTER WIRE WORKS DIVISION • WORCESTER, MASS.
Round and Shaped Steel Wire, Small Sizes

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866
THE WHELAND COMPANY
CHATTANOOGA 2, TENN.

BENDING BLOCKS or WELDING PLATENS



4 ft x 4 ft—5 ft x 5 ft—8 ft x 6 ft. Also other sizes. Cast steel blocks for layout, welding & assembly. Tools, stands & accessories. Write today for information.

ACORN IRON & SUPPLY CO.
Delaware Ave. & Poplar St., Philadelphia 23, Pa.

Like to speed up your reading?

TURN TO PAGES TWO AND THREE OF The IRON AGE AND LET THE

Digest of the Week in Metalworking

HELP YOU FIND FAVORITE FEATURES

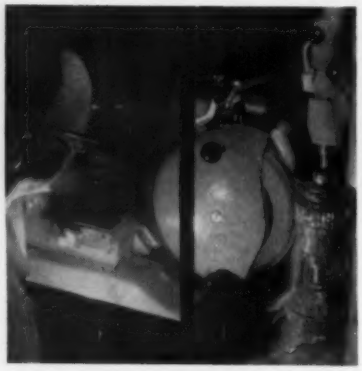
The IRON AGE

MACHINING: Gear Grinders

Fast precision worm gear grinding machines solve a serious production bottleneck . . . Gears are reported ground in only 1/3 the time formerly required . . . Accuracy held to 0.0004 in.

Faced with a serious bottleneck in its precision gear grinding operations, Warner & Swasey Co., Cleveland, has installed three new worm grinding wheel type gear grinding machines to increase its production capacity. The firm believes these will enable an output stepup while maintaining extreme accuracy in order to fill a steadily growing list of new machine tool orders.

So successful have these new gear grinders proven that the company has ordered for early delivery still another of the machines. This one handles gears up to 28 in. diam.



Gears are ground on this machine to 0.0004 in.

Spur and Helical Gearing

Using the new equipment for both spur and helical gearing, the company reports it now is able to grind precision gears in only 1/3 the time formerly required on conventional grinders, with accuracy held to 0.0004 in. In addition, success has been attained in the single operation grinding of tricky spiral gears and long addendum gears for turret lathes. Before it was necessary to split the grinding of these difficult parts into several separate operations.

Other Important Advantages

Other important advantages claimed from use of the new gear grinders: less maintenance expense, fewer wear points, and greater operator handling ease. An average worm grinding wheel is said to last approximately two years in normal service. The wheel is dressed with diamond dressers approximately once a day.

Four of the new machines are expected to handle, with greater accuracy, a job which required a total of 12 conventional gear grinders.

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 105. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Air Separation:

Air classification is called boon to coal industry

Only a decade ago, industry was not fully cognizant of the importance of obtaining particle sizes in the micron and near-micron range. Today, however, demands for quality control and guaranteed analyses exist in almost every field of industrial endeavor.

Through the air classification principle of almost infinitesimal

size particles, many of today's firms have come into their own. Commonplace products have thus gained new importance and diversification. Without achieving particle separation and consistency, experts say product development and purity would be impossible for many industries.

High Grade Fuel Demand

The coal industry, for example, was able to cope with demands for high grade fuel by separating impurities in coal through "dense media" separation. This utilizes finely ground heavy minerals suspended in a water slurry. "Magnafloat," a carefully ground and sized product prepared from natural iron oxide ore, was developed

Off-and-on, separator has worked a 24 hr day, 5 day wk for 14 yrs.

by Foote Mineral Co., Exton, Pa., especially for dense media coal beneficiation. Iron oxide ore fines are suspended in water and kept in constant motion to avoid settling. When unrefined coal is placed in this suspension, impurities such as clay, shale, etc., tend to separate and sink while the all-burnable coal is floated off the solution. "Simple—yet complex," says a Foote spokesman.

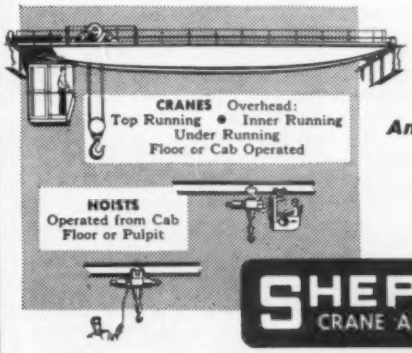
To achieve guaranteed particle exactness, Foote makes use of an eight-ft Sturtevant Air Separator installed in 1942 by the Sturtevant Mill Co., Boston, Mass.

SHEPARD NILES

Large Industrial Cranes 1 to 450 TONS

FOR OVER 50 YEARS, Shepard Niles has been a distinguished name in cranes. A pioneer in the overhead crane industry, Shepard has never failed to modernize and progress through the years. Today its cranes serve thousands of satisfied users, plus an ever-increasing number of new customers.

Shepard offers a complete line of heavy industrial cranes . . . from 1 to 450 tons . . . for light, medium or heavy service. Available for constant or intermittent duty in slow, medium and high speeds; operated from cab or floor. Let a Shepard Niles representative help you select the crane that best fits your plant's load-handling requirements.



• Write for latest Bulletin . . . request a representative to call.

America's Most Complete Line of Cranes and Hoists Since 1903

SHEPARD NILES
CRANE AND HOIST CORPORATION
1484 Schuyler Ave., Montour Falls, N.Y.

HYDRAULICS: Fire Resistant Hydraulic Fluid

New "snuffer" type hydraulic fluid resists fire when poured on molten or hot metal . . . Oxyacetylene torch fails to ignite it . . . Though no unusual properties are reported, it is said to replace any conventional fluid at less cost.

An economical new "snuffer" type hydraulic fluid reports fire-resistant qualities that prevent it from burning on contact with flames, heated metal surfaces or molten metal. It has been introduced by the Shell Oil Co. A special formulation of water, petroleum hydraulic oil and emulsifying agents, the fluid is particularly recommended by Shell for use in industries where hydraulic leaks or line ruptures would be immediate fire or explosion hazards.

Irus Fluid 902, as it is trade tabbed, eliminates combustion by releasing its water content as a protective steam blanket to quench fire. This "snuffer" action reduces local temperatures and displaces oxygen from the immediate area. In most cases, the remainder of the hydraulic fluid will not support its own combustion. The oil will continue hydraulic action should the water be dissipated for any reason.

Despite the water in its composition, Shell emphasizes that the fluid possesses all the petroleum hydraulic oil characteristics for proper functioning of hydraulically-operated machinery. It is non-corrosive on ferrous and most non-ferrous metals.

Compatible with normal system components, its film strength is said to provide good antiwear and antiscuff protection for closely-fitted machine parts. High shear rate viscosities report maximum hydraulic efficiency over a wide range of temperatures. The fluid is colored a bright yellow to permit instant recognition and location of possible leaks.

Now-you-see-it, now-you-don't as old fluid burns, new doesn't.

Replaces Any System

According to Shell, the fluid replaces any conventional mineral or synthetic oil hydraulic system, and can be installed without modification of lines, pumps, valves or cylinders.

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 105. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

New
ARMSTRONG
Armide CARBIDE INSERT
TOOL HOLDERS

The advantages of Carbide Cutters with the Multiedged "throw away" ARMIDE inserts

New ARMSTRONG Armide Carbide Insert Tool Holders hold multiedged, throw away Armide inserts. They end tool grinding and reduce down time. After an edge dulls, a slight turn of the clamping screw permits rapid indexing of the insert to a new cutting edge. Triangular inserts have 6 cutting edges; square inserts have 8 edges. They are available in three grades—Armide 350, 370, or 883.

ARMSTRONG Armide Carbide Insert Tool Holders are furnished either "Right Hand" or "Left Hand" in the two styles illustrated, each in 3 sizes.

ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
5209 W. ARMSTRONG AVE. • CHICAGO 30, ILL.

Buy ARMSTRONG TOOLS from your Industrial Distributor

In a pressure ignition spray test, it was forced through a 0.0145-in. diam sharp-edged orifice at 1000 psi, heated to 100°F.

Fails to Ignite

With an oxyacetylene torch adjusted for neutral flame, an attempt was made to ignite the fluid stream at distances up to 18 in. from the orifice. Under these conditions, it was impossible to ignite the fluid. In a hot manifold test prescribed under the same specification, a sand-blasted stainless steel tube was heated to 1300°F surface temperature. Ten milliliters of the test fluid were poured steadily on the tube in not less than 40 seconds, nor more than 60 seconds. Under these conditions, there was no continuous burning.

Shell doesn't claim any unusual properties for its hydraulic fluid. However, it is said to cost up to one-third less than synthetic oils.

Fasteners:

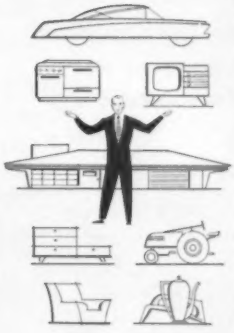
Socket head screw lives upped almost 1000 pct

One spring and axle company reports that they eliminated down time and increased socket head and screw lives by almost 1000 pct by switching to Potomac die steel bolts.

From left, turtle (for size), standard and Patomic screws.

The head screw's application was of unusual importance to the Rockwell Spring and Axle Co., Newark, Ohio. The insert die sections were held in place by

Part of extensive Logan System in brass mill. Roller Conveyor loop serves as coil storage ahead of pickler served by Downender in foreground. Coils are fed to storage line by Vertical Reciprocating Conveyor at right.
DEMING CO.
DETROIT BRASS & MAL'BLE
DETROIT TRANSMISSION DIV.
DE VILBISS CO.
DEVOE & RAYNOLDS CO.
DODGE MOTORS DIV.
JOHN DOUGLASS CO.
E. I. DuPONT DE NEMOURS
DOW CHEMICAL CO.
D
EASTMAN KODAK CO.
ELECTRIC AUTO-LITE CO.
ELECTRIC STEEL CASTINGS
ELECTROLUX CORP.
EMERSON ELECTRIC
ESSO STANDARD OIL
EUREKA MFG. CO.
EVEREDY CO.
E
FAIRBANKS-MORSE
FARNSWORTH RADIO & TV
FIRESTONE TIRE & RUB.
FISHER BODY CORP.
FLEISCHMAN CO.
FLINTKOTE CO.
FORD MOTOR CO.
FRANKFORT DISTILLERY
(cont.)
F
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
The LEADERS use Logan



"Staying out in front" often is just as difficult as getting there in the first place. That is one of the reasons why America's leading industries depend on Logan Conveyors as an integral part of their productive processes. Speeding output, enlarging capacity, conserving manpower, and decreasing labor turnover are major Logan functions which you, too, can use to advantage. Write for nearest engineer or for further information.

LOGAN CO., 545 CABEL ST., LOUISVILLE 6, KY.

Logan Conveyors

socket screws while the press hot formed truck axle housings. Dies and socket screws were subjected to a hot operation at from 1200° to 1275°F.

Continual operation at this temperature caused standard SAE alloy socket head screws to break after four or five days' normal operation. Test head screws made of Potomac steel have been in continual operation for eight weeks and are reported still good.

Old Screws Had Problems

When the standard SAE alloy screws broke it was often necessary to remove the broken screw section. Sometimes this was hard to do and would hold up production. In some cases, the die section had to be annealed, drilled and a larger hole tapped in the section.

Machining:

General purpose grade beats specials on tough job

Tough machining jobs don't always call for special carbide grades. Frequently a general purpose grade will do even better. Such are the well supported opinions at J. W. Bullard & Sons, Inc., Fairfield, Conn. A typical job, turning of a coupling, looks simple, but the steel (low-carbon chrome-moly-vanadium) is usually tough and scaly and the forgings have a decided warpage.

With all that scale, and with depth of cut due to warpage varying as much as from 0.070 to 0.180 in. per piece, tool breakage dropped tool life to only around 24 pieces per tool (4 pieces per grind) even though using specialized steel cutting grades.

The job was re-tooled with a Wesson Multicut tool holder using throw-away blanks of Wessonmetal 26, a wide range general purpose steel cutting grade. Tool performance jumped to 100 pieces per cutting edge (800 per insert) with no grinding required. Tool cost dropped from a previous 48 cents per piece to only 1.4 mills per piece.

With our battery of large electric furnaces and our large modern well equipped molding department, castings of this size are quite common in our production schedule.

Yet, if you require it, we can produce castings as light as only a few ounces. In fact, with our shell molding department we can produce in quantity very small pieces of any high alloy analysis desired.

Experience? Well, our work with static high alloy castings goes back to 1922 and with centrifugal castings back to 1931. This long experience is your assurance of a sound casting correctly alloyed.

THE DURALOY COMPANY
OFFICE AND PLANT: Scottdale, Pa.
EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.
CHICAGO OFFICE: 332 South Michigan Avenue

Saves Time... Cuts Costs

Rotary Planer • • • do milling jobs in one-third to one-seventh of time on an Espen-Lucas Rotary Planer.

Big Sawing • • • production cutting of large stock —rapid, easy, straight-to-a-line piece after piece—on Espen-Lucas Cold Sawing Machines.

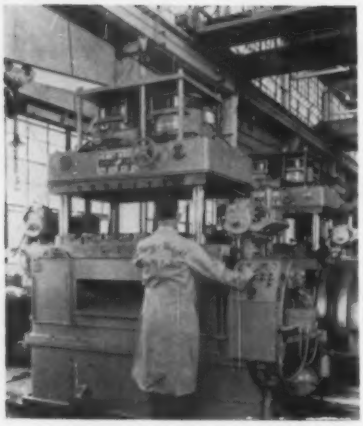
The **ESPEN-LUCAS** *Machine Works*

Front Street and Girard Ave., Phila. 23, Pa.

BUILDERS OF LARGE COLD SAWING MACHINES • ROTARY PLANERS • COLUMN FACERS • HEAVY TYPES OF SPECIAL MACHINERY

NEW EQUIPMENT

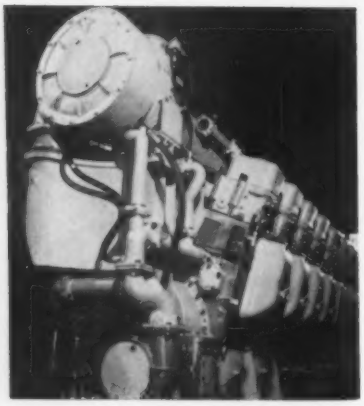
New and improved production ideas, equipment, services and methods described here offer production economies... for more data use the free postcard on page 105 or 106.



Press stamps large parts, fits progressive dies

Recently announced line of automatic double-crank dieing machines reportedly demonstrate a concept in metal forming equipment that can add substantially to die life. Equipment handles stampings requiring large bed areas, but not necessarily heavy tonnage. Same presses also have the strength for stamping parts by progressive die methods, when eccentric loading demands extra rigidity. Reduced unit cost of metal stampings is possible, it's claimed, through combining complex stamping and forming operations into one progressive sequence. Available in capacities of 25 to 500 tons, presses accommodate a variety of feeds. Extra frame rigidity helps maintain registration of punch and die under heavy loading. Maker says it conceived the new machine to extend to additional metal forming operations time and space savings of progressive dieing. *Henry & Wright Div., Emhart Mfg. Co.*

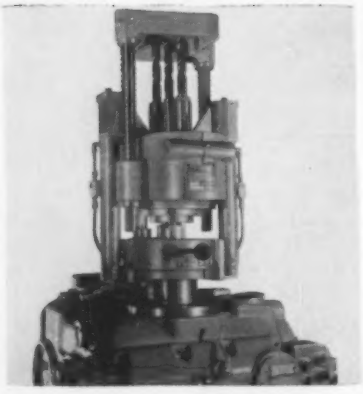
For more data circle No. 30 on postcard, p. 105



New series includes six, 12 and 16 cylinder engines

Capable of marathon running times encountered in stationary use, this 16 cylinder, 2400 hp diesel engine is part of a new series. It is said to have maintenance accessibility so that the engine is "off the line" as little as possible. Weight is controlled without sacrificing strength and rigidity. In the medium-speed model series, the in-line six and the V-type 12 and 16 cylinder models, answer most requirements for transportation use. The 12 cylinder model powers the company's new 1800 hp road switching locomotive, and the 2400 hp 16 cylinder engine is offered to upgrade the company's former 2250 hp road locomotive. The three engines are now being sold for nearly all applications with hp from 550 to 2400 at 1000 rpm. Engines contain fewer parts than comparable ones, maker says, thus reducing cost and upkeep. For marine applications, model may be equipped with a deep-sump base. *ALCO Products, Inc.*

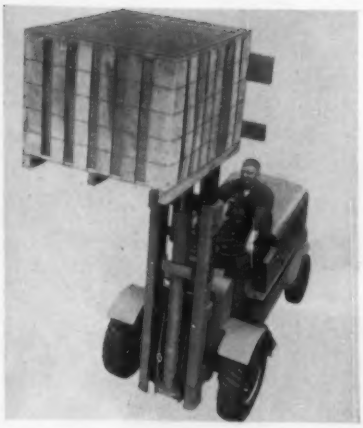
For more data circle No. 31 on postcard, p. 105



Air-balanced spindles help improve tool life

A pneumatic counterbalance now enables ready adaption of large multiple spindle drill and tapping heads to radial drills. Springs commonly supply the counterbalancing force. By balancing on air, it's claimed, drill feed mechanisms give less trouble, and may cost less to maintain. Tremendous pressures exerted by older counterbalances are said to have dire effects not only on the drill feed mechanism, but also on the operator. Controlled return feature of the head substantially improves operator safety. Two air cylinders hold the machine head in balance. The setup controls air on both ends of stroke. Just the right pressure counterbalances weight of the head during all portions of the stroke. Maker claims this can be of particular value in drilling relatively deep holes. Counterbalance mount swivels 360° for alignment. *U. S. Drill Head Co.*

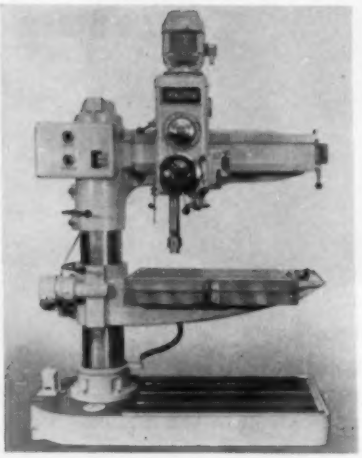
For more data circle No. 32 on postcard, p. 105



Fork lift maker introduces its most powerful model

Production has begun on a new model fork lift truck which the manufacturer says is the most powerful one it has ever built. It features a 6000 lb lift with power steering as standard equipment. Powered by a rugged 226 hp, 20 mph Continental engine with giant 7.50 x 15, 12 ply drive wheels (6.00 x 9, 10 plys at the rear), truck finds no terrain two difficult or load too rough, maker says. Its telescoping mast has a nine in. free lift with 10° forward tilt, four degree back for easy handling of awkward loads. Company's standard features include: oversize clutch and double acting hydraulic brakes, heavy duty transmission and welded all-steel frame, all working parts carefully machined for long life. Other standard equipment: "O" ring seals on cylinder heads, chevron packing on piston rods. Operator safety and comfort are emphasized along with wide visibility according to the manufacturer. *Truck-Man Div., Knickerbocker Co.*

For more data circle No. 33 on postcard, p. 105



Radial drill can bore and ream without pilot

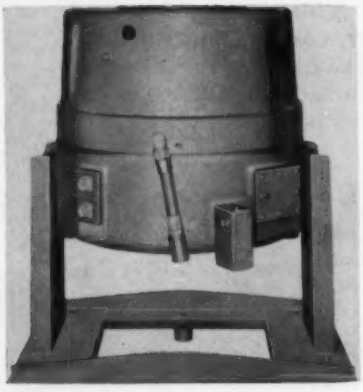
Pilotless boring, reaming and drilling are claimed often possible on a new radial drill. The 3-ft drill has a fixed arm of stationary height that can pivot 360°. A motorized table moves vertically on a 12-in. diam column to position the workpiece at the appropriate height for the job. Table moves out of the way when fixturing large workpieces. Both table and arm lock in place during the machining operation. A nitrided spindle fully supported for its full stroke combines with fixed arm design to assure accuracy in precision boring. Equipment offers 12 spindle speeds, ranging from 60 to 2100 rpm. Gears operate in oil, with reverse speeds attained rapidly through a double clutch. Fed manually, head travels on ground prismic slideways with antifriction bearings throughout. Precision machined table surface makes many reference points available for clamping workpiece. All controls are centrally located on the head and arm support, and because of the fixed arm design, they remain within easy reach of operator. *S. & S. Machinery Co.*

For more data circle No. 34 on postcard, p. 105

Cold rolled sheet toleranced by radiation gauge

Control equipment working with a radiation gauge can govern sheet thickness of ferrous and nonferrous cold-rolled stock within ± 0.0002 in. In one typical installation on a one-way mill, difficult-to-control clad steel is continuously toleranced to 0.0065 in., and held almost entirely to ± 0.0001 in. deviation. The rugged gauge head mounts compactly on close coupled, single-stand reversing mills, one way mills or Sendzimir mills according to the manufacturer. *Industrial Nucleonics Corp.*

For more data circle No. 35 on postcard, p. 105



Vibration exciter engineered for test chambers

Engineered specifically for environmental test chambers, a newly announced vibration exciter, also should prove useful in normal atmosphere testing, due to its high performance ratings. Of oil-cooled, electrodynamic design, the exciter can operate continuously at its full rated sinusoidal force output of 3500 or 5000 lbs, depending on power supply and as limited by displacement, it can supply equivalent acceleration in a frequency range from 5 to 2000 cps at chamber altitudes of 0 to 125,000 ft, relative humidities from 0 to 95 pct, and temperatures between −100 and +300°F. The exciter rotates 90° on its trunnion and operates in any position from vertical to horizontal. The flat, circular specimen table simplifies installation of a hooded temperature and humidity shield for limited cooling chambers. *MB Mfg. Co.*

For more data circle No. 36 on postcard, p. 105

or solid

a steel tube or bar for every purpose

TUBING: SEAMLESS AND WELDED

Whatever your tubing requirement—whatever kind and quantity you need—you can get quick delivery of a quality product with a single call to Ryerson.

That's because Ryerson stocks are the nation's largest, including more types and sizes, more tonnage, than any other source. And Ryerson service facilities are unequalled, too.

Hack saws, band saws and equipment for production lathe cutting and chamfering assure quick service on your orders. In addition, a staff of tubing specialists puts years of experience to work on your problems of tubing selection and fabrication. So call Ryerson for everything in tubing and tubing service.

In stock: Cold drawn and hot rolled seamless mechanical tubing, hot and cold rolled welded tubing, hydraulic and cylinder tubing, structural tubing, etc.

COLD FINISHED BARS

Careful handling, accurate cutting, vigilant inspection—these are just three of many ways in which Ryerson assures you of the highest quality in cold finished bars.

Stored in temperature-controlled rooms, spark-tested to guard against mixed steels, Ryerson cold finished bar stocks include rounds, squares, hex's, flats—screw steel, accuracy stock, turned, ground and polished shafting, Ledloy for fastest machining—everything you need. And even the hard-to-get intermediate sizes are on hand.

To help you select the best cold finished bar for each application, we have just published a simplified guide showing the comparative strength, cost, machinability, workability, etc. of all commonly used types. Write for your copy and call Ryerson when you need high quality cold finished bars.

RYERSON STEEL

In stock: Bars, structurals, plates, sheets, tubing, alloy and stainless steel, reinforcing bars, machinery & tools, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

The Iron Age SUMMARY . . .

Steel strike left metalworking hanging on the ropes . . . Inventories badly depleted and toughest scramble since 1952 in the works . . . Mill startups are delayed.

Scramble Begins . . . The steel strike left metalworking plants literally hanging on the ropes. It will be touch-and-go from a steel supply standpoint for many consumers for balance of year. End of the strike touched off the worst scramble since the walkout of 1952.

When the strike started, finished steel inventories in consumers' hands, including work in process, were at a record 21.5 million tons. The strike cost a minimum of 11 million ingot tons, or 8¼ million finished tons. Meanwhile, consumers used an estimated 7 million tons of finished steel. That leaves inventories in a sad shape.

And the worst is not yet over. Many mills will not turn a wheel until late this week due to the many details that must be cleared up before individual contracts are signed. After that, it will take some companies anywhere from two to three weeks before their production level returns to where it was before the strike.

It Cost Plenty . . . Meanwhile, cost of the strike to the steel industry was estimated at $335 million, including out-of-pocket expense during the shutdown and loss in net earnings based on what sales would have amounted to during the walkout. Wage loss to the steel workers ran about $250 million.

The race to replenish inventories in the months ahead will embrace virtually all products, including sheet and strip, plate, structurals, bars, tinplate, and oil country goods. Automotive is back in the picture for 1957 model requirements. Oil and gas, construction, and freight car building are hungry for steel. Structurals and plate are being snapped up at premium prices asked by importers, gray market operators, and conversion sources.

Trouble Ahead . . . On the labor front, steel mills braced themselves for new contract demands from John L. Lewis, head of the United Mine Workers. The mine workers will look for something equivalent to what the steel workers got and can threaten shutdown of steel company captive pits to enforce their demands.

The scrap market is literally running wild. Price shot up again in virtually all consuming areas. Industrial scrap was bid higher than pig iron in some centers. The upsurge anticipated strong mill demand from steelmaking furnaces.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	448	419	346	2,135
Ingot Index				
(1947-1949=100)	27.5	26.1	22.2	137.2
Operating Rates				
Chicago	6.0	5.0*	5.0	92.0
Pittsburgh	8.0	7.0	6.0	94.0
Philadelphia	0.0	0.0	5.0	94.0
Valley	13.0	13.0	13.0	92.0
West	24.0	25.0	24.0	98.0
Detroit	51.0	55.0	25.0	90.0
Buffalo	0.0	0.0	5.0	100.0
Cleveland	0.0	0.0	0.0	95.0
Birmingham	3.5	3.5	3.5	21.0
S. Ohio River	76.0	71.0*	63.0	73.0
Wheeling	55.0	55.0	58.0	95.0
St. Louis	103.0	95.0	68.0	98.0
Northeast	48.0	48.0	47.0	85.0
Aggregate	18.0	17.0	14.5	88.5

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.179	5.179	5.179	5.174
Pig Iron (Gross Ton)	$61.36	$61.36	$57.17	$59.09
Scrap, No. 1 hvy (gross ton)	$52.67	$49.50	$44.83	$43.33
Nonferrous				
Aluminum ingot	25.90	25.90	25.90	23.20
Copper, electrolytic	46.00	46.00	46.00	36.00
Lead, St. Louis	15.80	15.80	15.80	14.80
Magnesium	34.50	34.50	34.50	29.25
Nickel, electrolytic	64.50	64.50	64.50	67.67
Tin, Straits, N. Y.	100.25	95.75	94.75	97.50
Zinc, E. St. Louis	13.50	13.50	13.50	12.50

Order Logjam Building Up

Strike's end finds mills slowly getting ready to resume production . . . Prospect: They'll be behind on orders for months . . . Strike lost 8¼ million tons of finished steel.

◆ EVEN THOUGH the strike is settled, the concluding details of negotiation kept many mills from getting back into production quickly. This—together with the strike-caused loss of some 8¼ million tons of finished steel—is adding up to a king-size order logjam.

Customers with badly strike-dented inventories are already beginning to ask, "How soon can I get the steel I ordered before the strike?" or, "Will my order be one of the first to be delivered?"

And the indications are that no matter how fast they go, the mills are likely to be behind on orders for a long time to come. One mid-West mill says July tonnages won't be delivered until the middle of August and the first of September. The situation will continue that way for some time.

With the strike resulting in a loss of at least 8¼ million tons of finished steel, there's an order logjam that's going to get worse before it gets better.

Best guess on when the struck mills will resume operations seems to be the middle of this week and possibly even later. Here's what the mills report:

In Cleveland, only Jones & Laughlin sees any chance of pouring steel this week. National Tube at Lorain predicts some tonnage toward end of the week if contract comes through. Republic feels there will be no production this week.

At Pittsburgh, Allegheny Ludlum thinks contract talks could drag on the rest of the week. They believe even a mid-week start is an optimistic goal. Pittsburgh Steel is hopeful of working out a contract by the middle of the week, but has set no definite time on starting up.

Lukens Steel Co. was the first mill in the Philadelphia district to resume operations. It signed an interim agreement with the union Monday at 4 p.m. The firm's 3,700 workers were called back to work immediately. New contract follows the pattern except for expiration date which was moved back 31 days to July 31, 1959.

Price increases, an indication of what's to come in larger scale, also made news this week.

Calstrip Steel Corp., Los Angeles, raised low carbon, cold rolled strip steel by $12.00 a ton with the new price being $8.90 per 100 lb for 40,000 lb minimum carload lots.

Wickwire Spencer Steel Div., Colorado Fuel and Iron Corp. and Tonawanda Iron Div. raised pig iron prices $2.50 per ton. This was in line with price increases announced in THE IRON AGE last week by other producers. The new Wickwire Spencer prices were: basic iron, $64.50 per ton, foundry, $65.00, malleable, $65.50 and bessemer, $66.00. Tonawanda's prices: foundry, $63.00, malleable, $63.50, and bessemer, $64.00.

Another pig iron producer, Shenango Furnace Co., Pittsburgh, also announced a price increase of $2.50 a ton, effective August 1. Their new prices at Sharpsville producing point are: Basic, $62.50 a ton, foundry, $63.00, malleable, $63.00, and bessemer, $63.50.

Refractories prices have also increased with first quality fire clay brick advancing $6 per 1000, silica cement moving up $2.00-$3.00 per 1000, chrome and magnesite brick up $7.00 per net ton, and grain magnesite up $3.00 to $5.00 per net ton.

WAREHOUSES . . . Most of the larger outlets in the **Chicago** area are having trouble unloading galvanized, but one or two are troubled with outsize requests for coil stock. While the summer doldrums are on, most warehousemen are talking up a strong second half. The outlook there for products:

Sheet and Strip: No complaint with mills talking about capacity operations through rest of year, but inventory situation at consumer level is continuing pretty strong. Same situation applies in strip. Automotive parts buy margin in these grades is still lagging, but September pickup, or one even in August, looks pretty definite.

Bars: Cold finished bar in pretty fair supply, although hot rolled special quality isn't in too good a shape. There's really heavy demand for hot finished mill bar. Users went into the strike with 4 weeks' carryover in some cases. The warehouses are some help, but they've got relatively more cold finished bar in stock than they have hot rolled. So the hot rolled demand is pushing, but not hard enough to bring in conversion or foreign at this time.

Plates are still the toughest item. Foreign plate is being sought, but delivery is a problem. Foreign steel is being booked for delivery now, as soon as the Great Lakes open next year, which would mean April at the earliest. Fast-tax aid may provide eventual relief.

Structural: Same situation as in plate, although foreign business in light angles has dropped off. Wide angle virtually unobtainable. Delivery on foreign product is given as 30-90 days.

Purchasing Agent's Checklist

LABOR: How Union and Management made out in strike settlement ..... pp. 46-47

MARKETING: There are surprises in stainless market survey ..... p. 48

PRODUCTION: Screw industry faces tighter turns ahead ..... p. 49

TECHNICAL: Improved leaded steels are offering better machineability ..... p. 83

Comparison of Prices

(Effective July 31, 1956)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	July 31 1956	July 24 1956	July 2 1956	Aug. 2 1955
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.325¢	4.325¢	4.325¢	4.325¢
Cold-rolled sheets	5.325	5.325	5.325	5.325
Galvanized sheets (10 ga.)	5.85	5.85	5.85	5.85
Hot-rolled strip	4.325	4.325	4.325	4.325
Cold-rolled strip	6.28	6.28	6.28	6.29
Plate	4.52	4.52	4.52	4.52
Plates, wrought iron	10.40	10.40	10.40	9.30
Stainl's C-R strip (No. 302)	44.50	44.50	44.50	44.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$9.85	$9.85	$9.85	$9.05
Tinplates, electro (0.50 lb.)	8.55	8.55	8.55	7.75
Special coated mfg. ternes	9.10	9.10	9.10	7.85
Bars and Shapes: (per pound)				
Merchant bars	4.65¢	4.65¢	4.65¢	4.65¢
Cold finished bars	5.90	5.90	5.90	5.90
Alloy bars	5.65	5.65	5.65	5.65
Structural shapes	4.60	4.60	4.60	4.60
Stainless bars (No. 302)	38.25	38.25	38.25	38.25
Wrought iron bars	11.50	11.50	11.50	10.40
Wire: (per pound)				
Bright wire	6.60¢	6.60¢	6.60¢	6.25¢
Rails: (per 100 lb.)				
Heavy rails	$4.725	$4.725	$4.725	$4.725
Light rails	5.65	5.65	5.65	5.65
Semifinish Steel: (per net ton)				
Rerolling billets	$68.50	$68.50	$68.50	$68.50
Slabs, rerolling	68.50	68.50	68.50	68.50
Forging billets	84.50	84.50	84.50	84.50
Alloy blooms, billets, slabs	96.00	96.00	96.00	96.00
Wire Rod and Skelp: (per pound)				
Wire rods	5.025¢	5.025¢	5.025¢	5.025¢
Skelp	4.225	4.225	4.225	4.225
Finished Steel Composite: (per pound)				
Base price	5.179¢	5.179¢	5.179¢	5.174¢

	July 31 1956	July 24 1956	July 2 1956	Aug. 2 1955
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$66.51	$66.51	$65.26	$63.69
Foundry, Valley	60.50	60.50	60.50	59.00
Foundry, Southern Cin'ti	62.93	62.93	62.93	62.93
Foundry, Birmingham	57.67	57.67	56.33	55.38
Foundry, Chicago	63.00	63.00	60.50	59.00
Basic del'd Philadelphia	65.73	65.73	64.48	62.77
Basic, Valley furnace	60.00	60.00	60.00	58.50
Malleable, Chicago	63.00	63.00	60.50	59.00
Malleable, Valley	60.50	60.50	60.50	59.00
Ferromanganese, cents per lb.‡ 74 to 76 pct Mn base.	10.75¢	10.75¢	10.75¢	9.50¢
Pig Iron Composite: (per gross ton)				
Pig iron	$61.36	$61.36**	$57.17	$59.09
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$55.00	$50.50	$44.50	$45.00
No. 1 steel, Phila. area	52.00	51.50	46.50	43.50
No. 1 steel, Chicago	50.50	46.50	43.50	41.50
No. 1 bundles, Detroit	51.50	41.50	37.50	38.50
Low phos., Youngstown	57.50	54.50	46.50	46.50
No. 1 mach'y cast, Pittsburgh	55.50	54.50	54.50	44.50
No. 1 mach'y cast, Philadel'a.	55.50	54.50	54.50	45.50
No. 1 mach'y cast, Chicago	54.50	49.50	47.50	52.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	$52.67	$49.50	$44.83	$43.33
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.50	$14.50	$14.50	$13.25
Foundry coke, prompt	17.50	17.50	17.50	16.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	$46.00	$46.00	$46.00	$36.00
Copper, Lake, Conn.	46.00	46.00	46.00	36.00
Tin, Straits, New York	100.25†	95.75	94.75	97.50
Zinc, East St. Louis	13.50	13.50	13.50	12.50
Lead, St. Louis	15.80	15.80	15.80	14.80
Aluminum, virgin ingot	25.90	25.90	25.90	23.20
Nickel, electrolytic	64.50	64.50	64.50	67.67
Magnesium, ingot	34.50	34.50	34.50	29.25
Antimony, Laredo, Tex.	33.00	33.00	33.00	28.50

† Tentative. ‡ Average. * Revised. ** Corrected.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

←To identify producers, see Key on p. 130→

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	62.00	62.50	63.00	63.50	.....
Birdsboro, Pa. *B6*	64.50	65.00	65.50	66.00	.....
Birmingham *R3*	54.50	55.00*	.....	.....	.....
Birmingham *W9*	58.50	59.00*	63.00	.....	.....
Birmingham *U4*	58.50	59.00*	63.00	.....	.....
Buffalo *R3*	60.00	60.50	61.00	61.50	.....
Buffalo *H1*	60.00	60.50	61.00	.....	.....
Buffalo *W6*	60.00	60.50	61.00	61.50	.....
Chester *C17*	62.00	62.50	63.00	.....	.....
Chicago *I4*	62.50	63.00	63.00	63.50	.....
Cleveland *A5*	60.00	60.50	60.50	61.00	65.00†
Cleveland *R3*	60.00	60.50	60.50	61.00	.....
Duluth *I4*	62.50	63.00	63.00	63.50	67.50‡
Erie *I4*	62.50	63.00	63.00	63.50	67.50‡
Everett *M6*	.....	63.75	64.25	.....	.....
Fontana *K1*	70.00	70.50	.....	.....	.....
Geneva, Utah *C7*	60.00	60.50	.....	.....	.....
Granite City *G2*	64.40	64.90	65.40	.....	.....
Hubbard *Y1*	.....	.....	60.50	.....	.....
Midland *C11*	60.00	.....	.....	.....	.....
Minnequa *C6*	62.00	62.50	63.00	.....	.....
Monessen *P6*	60.00	.....	.....	.....	.....
Neville Is. *P4*	62.50	63.00	63.00	63.50	67.50†
N. Tonawanda *T1*	.....	63.00	63.50	64.00	.....
Pittsburgh *U1*	60.00	.....	60.50	61.00	.....
Sharpsville *S3*	60.00	60.50	60.50	61.00	.....
So. Chicago *R3*	60.00	.....	60.50	.....	.....
Steelton *B3*	62.00	62.50	63.00	63.50	68.00
Swedeland *A2*	64.50	65.00	65.50	65.50	.....
Toledo *I4*	62.50	63.00	63.00	63.50	.....
Troy, N. Y. *R3*	62.00	62.50	63.00	63.50	68.00
Youngstown *Y1*	.....	.....	60.50	61.00	.....

DIFFERENTIALS: Add, 50¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese or portion thereof over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional, 0.25 pct nickel * Add $1.00 for 0.31-0.69 pct phos. † Intermediate low phos.

Silvery iron: Buffalo, *H1*, $70.25; Jackson, *J1, G1*, $69.00. Add $1.25 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill.

Product	201	202	301	302	303	304	316	321	347	410	416	430
Ingots, reroll.	18.50	19.75	19.25	20.50	—	21.75	33.00	26.50	35.25	15.00	—	15.25
Slabs, billets, reroll.	23.00	25.50	23.75	26.25	26.75	27.50	41.75	33.50	44.50	19.50	—	19.75
Forg. dcs., die blks., rgs.	—	—	—	—	—	—	—	—	—	—	—	—
Billets, forging	—	31.00	31.75	32.00	34.75	33.75	52.75	39.75	52.50	25.50	26.00	26.00*
Barr, struct.	—	36.75	38.00	38.25	41.00	40.25	62.75	47.25	62.00	30.50	31.00	31.00
Plates	—	38.75	40.00	40.25	42.75	43.00	66.00	51.25	66.75	31.75	33.00	32.25
Sheets	42.25	42.50	44.25	44.50	52.25	47.25	70.25	56.25	75.50	36.25	—	36.75
Strip, hot-rolled	31.00	33.50	32.00	34.50	—	37.25	56.75	45.75	61.25	28.00	—	28.75
Strip, cold-rolled	39.00	42.50	41.00	44.50	—	47.25	70.25	56.25	75.50	36.25	—	36.75
Wire CF, HR; Rod HR	—	—	36.00	36.25	39.00	38.25	56.75	45.00	60.00	29.00	29.50	29.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2* (2.25¢ lower on Type 430), *J2*; Baltimore, *E1*; Middletown, O., *A7*) Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*; Philadelphia, *D5*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (.25¢ per lb higher); *W1* (.25¢ per lb higher); New Bedford, Mass., *R6*; Gary, *U1*.

Bar: Baltimore, *A7*; S. Duquesne, Pa. *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1, F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; S. Chicago, *U1*; Syracuse, N. Y. *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T3*; Ft. Wayne, *I4*; Philadelphia, *D5*; Detroit, *R3*; Gary, *U1*.

Wire: Waukegan, *A5*) Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Philadelphia, *D5*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forged discs, die blocks, rings: Pittsburgh, *C11*; Syracuse, *C11*; Pursdale, Mich., *A3*; Washington, Pa., *J2*.

Forgings billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*.

Auto Lists Trigger Market

Closing of lists sets off market . . . Prices soar in all areas . . . Strength extends to blast furnace and cast grades in runaway market . . . Serious shortage possible.

◆ CLOSING of the automotive lists opened the gates of the scrap market, sending prices soaring in a runaway market.

Key to the situation were list prices of from $62 to $64 for prime grades of automotive scrap. While not immediately backed up by orders for dealer scrap in all markets, the big jump, from $13 to $14 over a month ago, sent prices of openhearth scrap up varying amounts in all markets.

Indications are that mills will be confronted with a serious scrap shortage when they resume operating after the strike. Dealers are not long on supply, will hold out for better prices.

Mills may not be scraping the bottom of their yards, but they are not in too comfortable positions. In the Midwest, mills operating during the strike, and buying scrap at the same time, were not able to increase inventories.

Brokers are finding it difficult to place orders as dealers are reluctant to commit themselves until the market level is established.

Turnings also show unusual strength. The loss of ore during the strike and the probably capacity rate of blast furnace operation for the remainder of the year resulted in much higher prices in some markets. Cast also strengthened, sending prices up in most markets.

The market is in a wide state of change as prices rebounded. Because of more critical shortages in some areas than in others, normal differentials between markets ceased to apply in some cases. It may be weeks before the market settles down to normal.

With prices going up in all eastern and midwestern markets, THE IRON AGE composite price jumped to $52.67, up $3.17 from $49.50 price a week ago. This is the highest point the composite price has reached since May 8.

Pittsburgh . . . Prices of all grades are up. Openhearth grades advanced $2 on basis of strength at broker level and in line with a major jump in prices paid for industrial bundles. Blast furnace grades are all up $4 on a mill purchase. Low phos, cast and railroad grades are also up. The market is strong and tight and dealers are holding on to the small amount of scrap that is available. Brokers are reluctant to take mill orders until they have a better indication of where the market will settle.

Chicago . . . The market has broken loose. Sales early in the week of railroad grades and purchases at $53 of factory bundles failed to hold in check the general market advance. While some tonnage moved at $53, an even heavier quantity moved at higher prices as the week advanced. Turnings were offered at as high as $34 to $36, but met with mill resistance.

Philadelphia . . . Primary and secondary steelmaking grades held firm this week but blast, premium and some railroad grades moved up $1 to $2. Most yards were quiet, and the general feeling is that activity will be suppressed for another week. After that, prices are expected to jump considerably. Dealers don't want to go short for the month of August, so they're not committing themselves on orders. For the moment, the problem is one of supply, not of price.

New York . . . Effects of the end of the steel strike did not materialize in the form of new scrap orders in this market. But export business and orders from operating mills continue brisk. Brokers and dealers agree that orders from mills preparing to start up will have to be higher. Accordingly, steelmaking and blast furnace grades are all up.

Detroit . . . Shortage of scrap plus basic agreement of steel labor sent prices skyrocketing. August auto lists closed at over $62, which is above the price of pig iron in most districts. Dealer prices advanced on appraisal and are expected to hold or go higher because of shortage of material.

Cleveland . . . Valley purchase early last week triggered a scramble which shot the price up an additional $6 there and $8 in a belated sympathetic surge in Cleveland. The end is not in sight as the first local auto list went for $62, or about $14 above a month ago. One fringe area electric mill paid $58 for electric steel, $57 for openhearth grades and $48 for No. 2 steel. Another electric producer is taking selected No. 2 bundles. Dealers expect little pickup in plant scrap until after Labor Day, and some are being offered $4 premium by brokers caught behind in the rush.

Birmingham . . . Prices of No. 1 grades jumped $6 as the aftermath of the steel strike. Electric furnace grades showed considerable strength, followed by higher prices for openhearth grades. Export continues strong; cast is also up.

St. Louis . . . With steel mills operating over 100 pct, mills which operated during the strike are taking all the scrap offered. Receipts in July were less than consumption, but improvement is hoped for in August. Prices are generally higher, with further advances predicted.

Cincinnati . . . Sporadic over-market broker buying proved firmly grounded as the price shot up $10 on some top dealer grades. Levels may climb even higher to replace production scrap going out of the district. An area list went at about $60. Dealer yards have small inventories, but higher prices should bring out more tonnage.

Buffalo . . . A feeling of strength underlies the market here. Inventories are low and dealers expect a strong demand when mills do place orders.

Boston . . . No. 1 grades soared $5 on the basis of a mill purchase. Export is gaining strength and prices of all steelmaking and most cast grades climbed with the tightening market.

West Coast . . . The market is strong here as mills that were down during the strike prepare to resume operations. Inventories are not high and export continues strong.

A SYMBOL OF LEADERSHIP
IN IRON & STEEL SCRAP
SINCE 1889

Luria Brothers and Company, Inc.

MAIN OFFICE
PHILADELPHIA NATIONAL BANK BLDG.
Philadelphia 7, Penna.

PLANTS
LEBANON, PENNA. DETROIT (ECORSE), MICHIGAN
READING, PENNA.
MODENA, PENNA. PITTSBURGH, PENNA.
ERIE, PENNA.

OFFICES
BIRMINGHAM, ALA. HOUSTON, TEXAS PUEBLO, COLORADO
BOSTON, MASS. LEBANON, PENNA. READING, PENNA.
BUFFALO, N. Y. LOS ANGELES, CAL. ST. LOUIS, MO
CHICAGO, ILLINOIS NEW YORK, N. Y. SAN FRANCISCO, CAL.
CLEVELAND, OHIO PITTSBURGH, PA. SEATTLE, WASH.
DETROIT, MICH. MONTREAL, CANADA

EXPORTS-IMPORTS LIVINGSTON & SOUTHARD, INC. 99 Park Ave., New York, N. Y. Cable Address: FORENTRACO

Scrap Prices *(Effective July 31, 1956)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$54.50 to $55.50
No. 2 hvy. melting	47.50 to 48.50
No. 1 bundles	54.50 to 55.50
No. 2 bundles	43.50 to 44.50
Machine shop turn.	36.00 to 37.00
Mixed bor. and ms. turn.	36.00 to 37.00
Shoveling turnings	40.00 to 41.00
Cast iron borings	40.00 to 41.00
Low phos punch'gs plate	61.00 to 62.00
Heavy turnings	49.00 to 50.00
No. 1 RR. hvy. melting	60.00 to 61.00
Scrap rails, random lgth.	65.00 to 66.00
Rails 2 ft and under	69.00 to 70.00
RR. steel wheels	61.00 to 62.00
RR. spring steel	61.00 to 62.00
RR. couplers and knuckles	61.00 to 62.00
No. 1 machinery cast	55.00 to 56.00
Cupola cast	47.00 to 48.00
Heavy breakable cast	45.00 to 46.00

Chicago

No. 1 hvy. melting	$50.00 to $51.00
No. 2 hvy. melting	43.00 to 44.00
No. 1 factory bundles	56.00 to 57.00
No. 1 dealers' bundles	52.00 to 53.00
No. 2 dealers' bundles	40.00 to 41.00
Machine shop turn.	29.00 to 30.00
Mixed bor. and turn.	31.00 to 32.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	31.00 to 32.00
Low phos. forge crops	59.00 to 60.00
Low phos. punch'gs plate	59.00 to 60.00
Low phos. 3 ft and under	58.00 to 59.00
No. 1 RR. hvy. melting	56.00 to 57.00
Scrap rails, random lgth.	67.00 to 68.00
Rerolling rails	77.00 to 78.00
Rails 2 ft and under	75.00 to 76.00
Locomotive tires, cut	62.00 to 63.00
Cut bolsters & side frames	62.00 to 63.00
Angles and splice bars	68.00 to 69.00
RR. steel car axles	75.00 to 76.00
RR. couplers and knuckles	60.00 to 62.00
No. 1 machine cast	54.00 to 55.00
Cupola cast	50.00 to 51.00
Heavy breakable cast	43.00 to 44.00
Cast iron brake shoe	44.00 to 45.00
Cast iron wheel	55.00 to 56.00
Malleable	65.00 to 66.00
Stove plate	46.00 to 47.00
Steel car wheels	61.00 to 62.00

Philadelphia Area

No. 1 hvy. melting	$52.00 to $53.00
No. 2 hvy. melting	44.00 to 45.00
No. 1 bundles	52.00 to 53.00
No. 2 bundles	41.00 to 42.00
Machine shop turn.	35.00 to 36.00
Mixed bor. short turn.	35.00 to 36.00
Cast iron borings	37.00 to 38.00
Shoveling turnings	38.00 to 39.00
Clean cast chem. borings	42.00 to 43.00
Low phos. 5 ft and under	53.00 to 54.00
Low phos. 2 ft and under	55.00 to 56.00
Low phos. punch'gs	55.00 to 56.00
Elec. furnace bundles	53.00 to 54.00
Heavy turnings	47.00 to 48.00
RR. steel wheels	60.00 to 61.00
RR. spring steel	60.00 to 61.00
Rails 18 in. and under	66.00 to 67.00
Cupola cast	48.00 to 50.00
Heavy breakable cast	52.00 to 53.00
Cast iron car wheels	57.00 to 58.00
Malleable	65.00 to 66.00
Unstripped motor blocks	34.00 to 35.00
No. 1 machinery cast	55.00 to 56.00

Cleveland

No. 1 hvy. melting	$53.00 to $54.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	53.00 to 54.00
No. 2 bundles	37.00 to 38.00
No. 1 busheling	53.00 to 54.00
Machine shop turn.	32.50 to 33.50
Mixed bor. and turn.	36.50 to 37.50
Shoveling turnings	36.50 to 37.50
Cast iron borings	36.50 to 37.50
Cut struct'r'l & plates, 2 ft & under	60.00 to 61.00
Drop forge flashings	53.00 to 54.00
Low phos. punch'gs, plate	54.00 to 55.00
Foundry steel, 2 ft & under	55.00 to 56.00
No. 1 RR. heavy melting	56.00 to 57.00
Rails 2 ft and under	74.00 to 75.00
Rails 18 in. and under	75.00 to 76.00
Railroad grate bars	43.00 to 44.00
Steel axle turnings	39.00 to 40.00
Railroad cast	55.00 to 56.00
No. 1 machinery cast	55.00 to 56.00
Stove plate	52.00 to 53.00
Malleable	61.00 to 62.00

Youngstown

No. 1 hvy. melting	$56.00 to $57.00
No. 2 hvy. melting	44.00 to 45.00
No. 1 bundles	56.00 to 57.00
No. 2 bundles	40.00 to 41.00
Machine shop turn.	33.00 to 34.00
Shoveling turnings	38.00 to 39.00
Cast iron borings	38.00 to 39.00
Low phos. plate	57.00 to 58.00

Buffalo

No. 1 hvy. melting	$47.00 to $48.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 busheling	47.00 to 48.00
No. 1 bundles	47.00 to 48.00
No. 2 bundles	35.00 to 36.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	29.00 to 30.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. plate	55.00 to 56.00
Scrap rails, random lgth.	57.00 to 58.00
Rails 2 ft and under	65.00 to 66.00
RR. steel wheels	60.00 to 61.00
RR. spring steel	60.00 to 61.00
RR. couplers and knuckles	60.00 to 61.00
No. 1 machinery cast	50.00 to 51.00
No. 1 cupola cast	48.00 to 49.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$51.00 to $52.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles, openhearth	51.00 to 52.00
No. 2 bundles	40.00 to 41.00
New busheling	51.00 to 52.00
Drop forge flashings	50.50 to 51.50
Machine shop turn.	29.00 to 30.00
Mixed bor. and turn.	32.00 to 33.00
Shoveling turnings	32.00 to 33.00
Cast iron borings	32.00 to 33.00
Low phos. punch'gs, plate	51.00 to 52.00
No. 1 cupola cast	51.00 to 52.00
Heavy breakable cast	44.00 to 45.00
Stove plate	45.00 to 46.00
Automotive cast	54.00 to 55.00

St. Louis

No. 1 hvy. melting	$48.00 to $49.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	46.00 to 47.00
No. 2 bundles	35.00 to 36.00
Machine shop turn.	30.00 to 31.00
Cast iron borings	31.00 to 32.00
Shoveling turnings	31.00 to 22.00
No. 1 RR. hvy. melting	56.00 to 57.00
Rails, random lengths	63.00 to 64.00
Rails 18 in. and under	66.00 to 67.00
Locomotive tires uncut	59.00 to 60.00
Angles and splice bars	61.00 to 62.00
Std. steel car axles	75.00 to 76.00
RR. specialties	62.00 to 63.00
Cupola cast	51.00 to 52.00
Heavy breakable cast	45.00 to 46.00
Cast iron brake shoes	48.00 to 49.00
Stove plate	44.00 to 45.00
Cast iron car wheels	50.00 to 51.00
Rerolling rails	72.00 to 73.00
Unstripped motor blocks	40.00 to 41.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 bundles	44.00 to 45.00
No. 2 bundles	32.00 to 33.00
No. 1 busheling	44.00 to 45.00
Elec. furnace, 3 ft & under	46.00 to 47.00
Machine shop turn.	24.00 to 24.50
Mixed bor. and short turn.	25.00 to 26.00
Shoveling turnings	28.00 to 28.50
Clean cast chem. borings	29.00 to 30.00
No. 1 machinery cast	43.00 to 43.50
Mixed cupola cast	38.00 to 38.50
Heavy breakable cast	40.50 to 41.50
Stove plate	35.00 to 36.00
Unstripped motor blocks	30.00 to 31.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$46.00 to $47.00
No. 2 hvy. melting	37.00 to 38.00
No. 2 bundles	34.00 to 35.00
Machine shop turn.	27.50 to 28.50
Mixed bor. and turn.	27.50 to 28.50
Shoveling turnings	32.00 to 33.00
Clean cast chem. borings	29.00 to 30.00
No. 1 machinery cast	46.00 to 46.50
Mixed yard cast	43.00 to 43.50
Charging box cast	43.00 to 43.50
Heavy breakable cast	43.00 to 43.50
Unstripped motor blocks	32.00 to 33.00

Birmingham

No. 1 hvy. melting	$40.00 to $41.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	30.00 to 31.00
No. 1 busheling	40.00 to 41.00
Machine shop turn.	27.00 to 28.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	22.00 to 23.00
Electric furnace bundles	46.00 to 47.00
Bar crops and plate	54.00 to 55.00
Structural and plate, 2 ft	53.00 to 54.00
No. 1 RR. hvy. melting	49.00 to 50.00
Scrap rails, random lgth.	59.00 to 60.00
Rails, 18 in. and under	62.00 to 63.00
Angles & splice bars	58.00 to 59.00
Rerolling rails	64.00 to 65.00
No. 1 cupola cast	50.00 to 51.00
Stove plate	48.00 to 49.00
Charging box cast	35.00 to 36.00
Cast iron car wheels	39.00 to 40.00
Unstripped motor blocks	40.00 to 41.00
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$52.50 to $53.50
No. 2 hvy. melting	44.50 to 45.50
No. 1 bundles	52.50 to 53.50
No. 2 bundles	40.50 to 41.50
Machine shop turn.	32.50 to 33.50
Mixed bor. and turn.	34.50 to 35.50
Shoveling turnings	35.50 to 36.50
Cast iron borings	34.50 to 35.50
Low phos. 18 in. & under	56.50 to 57.50
Rails, random lengths	61.00 to 62.00
Rails, 18 in. and under	69.50 to 70.50
No. 1 cupola cast	46.00 to 47.00
Hvy. breakable cast	46.00 to 47.00
Drop broken cast	55.00 to 56.00

San Francisco

No. 1 hvy. melting	$43.00
No. 2 hvy. melting	40.00
No. 1 bundles	42.00
No. 2 bundles	35.00
No. 3 bundles	29.00
Machine shop turn.	24.00
Cast iron borings	25.00
No. 1 RR. hvy. melting	43.00
No. 1 cupola cast	48.00

Los Angeles

No. 1 hvy. melting	$42.00
No. 2 hvy. metling	38.00
No. 1 bundles	41.00
No. 2 bundles	31.00
No. 3 bundles	27.00
Machine shop turn.	$21.00 to 22.00
Shoveling turnings	24.00
Cast iron borings	24.00
Elec. furn. 1 ft and under	42.00
No. 1 RR. hvy. melting	42.00
No. 1 cupola cast	45.00

Seattle

No. 1 hvy. melting	$44.00
No. 2 hvy. melting	40.00
No. 2 bundles	31.00
No. 3 bundles	27.00
No. 1 cupola cast	45.00
Mixed yard cast	45.00

Hamilton, Ont.

No. 1 hvy. melting	$43.00
No. 2 hvy. melting	38.00
No. 1 bundles	43.00
No. 2 bundles	35.00
Mixed steel scrap	37.00
Bushelings	33.50
Bush., new fact., prep'd	41.00
Bush., new fact., unprep'd	37.00
Machine shop turn.	21.00
Short steel turn.	24.00
Mixed bor. and turn.	22.00
Rails, rerolling	51.00
Cast scrap	50.00

for lower maintenance

it's ohio magnets

Ohio Magnets cost less to maintain because they're built with an extra margin of safety. So for extra magnet life, extra magnet value—always specify Ohio Magnets and Ohio Magnet Controllers. There's a type and size for every lifting job. Send for free copy of Bulletin 112, or consult the Yellow Pages for Ohio offices in principal cities. AA-1078

THE OHIO ELECTRIC MFG. CO.
5400 DUNHAM ROAD • MAPLE HEIGHTS
CLEVELAND, OHIO

Ohio Also Makes Separation Magnets • Nail Making Machines • Fractional Horsepower Shell and Torque Motors

Expect Aluminum Price Hike

New labor pact will boost aluminum price . . . Increase expected to be about 1¢-2¢ . . . Suez seizure, Malayan strike threat, higher demand, upset tin market.

◆ IT'S aluminum's turn.

As soon as the United Steel Workers concluded talks with the steel companies, they turned to aluminum.

USW represents the largest segment of the industry. Second major aluminum union is the Aluminum Workers International.

When the smoke clears the important results, from the consumer's standpoint, will be a round of price increases in primary aluminum and mill products.

In 1955, unions got a 15¢ package wage increase. Price of aluminum pig jumped 1¢ per lb, and 99% + ingot rose 1.2¢ per lb.

With a settlement along the line of the 20.3¢ granted USW by steel industry the price increase might be between 1¢ and 2¢ per lb.

Other news on the aluminum front is good, for both short-term and long-range.

A meeting of truck trailer manufacturers revealed that immediate outlook was for continuation of the increased use of aluminum in truck and trailer parts and bodies. Estimates for 1956 run about 25,000 tons, a definite gain over 1955. Not the least of the influencing factors as far as bodies are concerned, is the development of more efficient color anodizing methods.

A commission consisting of representatives of Aluminum Ltd., British Aluminum, and the governments of Great Britain and the Gold Coast have released a lengthy report. The gist is that it is economically, commercially, and technically sound to consider development of aluminum production facilities in the Gold Coast, on the western coast of Africa. However, indications are that it will take three or four years before the project gets off the ground, because of the increase in costs since the beginning of the study. The goal will be an annual output of about 210,000 tons.

The report says that the project will require five steps: development of bauxite mines, construction of a smelter building, a railroad, completion of the port, and construction of a dam for the necessary water power.

TIN . . . Action at the Suez Canal was the most important, but not the only factor which served to push the tin price closer to $1 per lb than it has been since the beginning of the year.

The other important developments were: 1) Setting of August 7 as the date on which almost 17,000 members of Malayan Mine Workers Union will go out on strike unless a settlement is reached on their demand for retroactive premium pay for Sunday, 2) settlement of the steel strike which would put the tin market's best customers, tin plate makers, back into production.

On the matter of Egypt's seizure of the Suez Canal, if rates are boosted or the canal closed to British or American ships, all bets are off as far as tin's outlook for stability.

Some 40,000 to 50,000 tons of tin per year arrive in the U. S. from Malaya. Around the Cape adds 3500 miles to the trip. With tin plate mills back in business there is no attitude of "wait and see." Consumers must buy and pay the higher price. Result: tin may again hit the $1 per lb unless the situation quiets down soon.

COPPER . . . It looks like all work and no play for USW this year. When the aluminum industry pact is safely tucked away, it will be copper's turn. USW represents only a minor segment of the copper industry, but some of its shops are in vital areas. For instance, USW represents workers in the American Smelting and Refining smelter (which does almost exclusively Kennecott copper smelting) and the Kennecott refinery in Utah.

If USW follows the pattern set at the steel negotiations and continued in aluminum industry talks, there may be trouble. Certain features granted by both steel and aluminum, such as supplementary unemployment benefits and cost of living clauses are unheard of in copper.

The major union in the industry, Mine, Mill & Smelter Workers, does not have these concessions.

NICKEL . . . Senator Dennis Chavez, Dem., N. Mex., has proposed legislation to exempt several nickel products from import duties. However, since Congress has adjourned it will have to be reintroduced next session to be considered. New items would be nickel in pigs, ingots, shot, cubes, grains, cathodes or similar forms. Import duty on these is now 3¢ per lb.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	July 25	July 26	July 27	July 28	July 30	July 31
Copper, electro, Conn.	40.00	40.00	40.00	40.00	40.00	40.00
Copper, Lake, delivered	40.00	40.00	40.00	40.00	40.00	40.00
Tin, Straits, New York	97.75	97.75	98.50	....	100.25	100.25*
Zinc, East St. Louis	13.50	13.50	13.50	13.50	13.50	13.50
Lead, St. Louis	15.80	15.80	15.80	15.80	15.80	15.80

Note: Quotations are going prices. **Tentative*

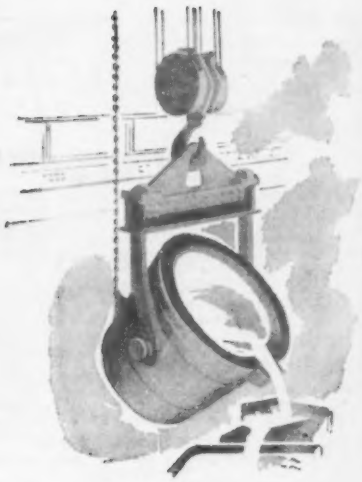
Monthly Average Metal Prices

(Cents per lb except as noted)

Average prices of the major nonferrous metals in July based on quotations appearing in THE IRON AGE, were as follows:

Electrolytic copper		Straits tin, New York	96.239
Del'd Conn. Valley	41.68	Zinc, E. St. Louis	13.50
Lake copper, delivered	43.28	Lead, St. Louis	15.80

Note: Quotations are going prices.



Erosion From Molten Copper Reduced 300%

23-Ton Ladle Protected With HASCROME rod by Submerged-Arc Method

The hard-facing operation shown above will increase the service life of this cast steel ladle by as much as 300 per cent. The material being applied is HASCROME rod . . . a high chromium alloy that effectively resists the destructive chemical action of molten copper. The alloy is deposited on the bottom and spouts of the ladle . . . the areas most vulnerable to erosion during pouring operations.

Despite the size of the ladle . . . 6 ft. high and about 8 ft. in diameter . . . the facing operation was accomplished rapidly. Coiled rod, applied by mechanized submerged-arc equipment, was used to cover the bottom and the spouts of the ladle. Facing speed averaged 7 inches per minute. Manual metallic-arc equipment and 14-in. long coated rods were used to face the contours around the spouts.

HASCROME rod, used so successfully here, is an iron-base material that also excels in applications requiring a tough, abrasion-resistant alloy. It has outstanding resistance to impact and sudden shocks.

There are 19 HAYNES hard-facing alloys . . . a wide selection that guarantees you the right rod at the right price for your wear problem. They all can be deposited with standard welding equipment. For descriptive literature on the complete line of HAYNES rods, contact your nearest Haynes Stellite Company office.

HAYNES TRADE-MARK ALLOYS

HAYNES STELLITE COMPANY

A Division of Union Carbide and Carbon Corporation

UCC

General Offices and Works: Kokomo, Indiana

Sales Offices

Chicago • Cleveland • Detroit • Houston • Los Angeles • New York • San Francisco • Tulsa

"Haynes" and "Hascrome" are registered trade-marks of Union Carbide and Carbon Corporation.

Nonferrous Prices *(Effective July 31, 1956)*

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.136–.249	.250–3.
1100, 3003	42.3	40.2	39.0	38.0
5052	49.8	44.9	43.2	41.4
6061-0	46.9	42.7	40.9	40.8

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6–8	43.1–44.8	58.1–61.7
12–14	43.8–45.2	59.0–63.3
24–26	46.8–47.2	69.2–73.6
36–38	55.1–55.7	92.0–95.8

Screw Machine Stock—2011-T-3

Size*	¼	⅜–⅝	¾–1	1⅛–1½
Price	56.0	54.9	53.6	51.6

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.310	$1.742	$2.175	$2.605
.024 gage	1.630	2.177	2.707	3.247

MAGNESIUM

(f.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type→ Gage→	.250–3.00	.250–2.00	.188	.081	.032
FS1 Stand. Grade	.....	65.6	66.5	75	100
FS1 Spec.	.....	88.9	91.1	103.5	103.1
Trend Plate	.....	67.8	68.9	.....	.....
Tooling Plate	70.2	.....	.....	.....	.....

Extruded Shapes

factor→	6–8	12–14	24–26	36–38
Comm. Grade (FS)	66.4–69.0	67.5–69.6	72.1–72.7	84.9–85.8
Spec. Grade (AZ31B)	81.4–84.0	82.5–84.6	87.1–87.7	99.9–100.8

Alloy Ingot

AZ91B (Die Casting) ..... 35 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 39.25 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	102	83	99
Strip, CR	102	92	125
Rod, Bar, HR	87	74	93
Angles, HR	87	74	93
Plate, HR	97	87	95
Seamless tube	122	110	153
Shot, blocks	...	71	...

COPPER, BRASS, BRONZE

(Freight included on 500 lbs)

	Sheet	Wire	Rod	Tube
Copper	61.63	.....	.....	61.82
Brass, 70/30	52.10	52.64	.....	55.01
Brass, Low	55.85	56.39	55.75	58.66
Brass, R L	57.19	57.73	57.13	60.00
Brass, Naval	55.72	.....	50.03	58.88
Muntz Metal	53.84	47.85	49.65	.....
Comm. Bz.	59.08	59.62	59.02	61.64
Mang. Bz.	59.46	.....	53.56	.....
Phos. Bz. 5%	79.58	.....	80.08	.....

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $12.10-$12.60; alloy, $15.00-$15.75; Plate, HR, commercially pure, $10.00-$10.50; alloy, $11.50-$12.00. Wire, rolled and/or drawn, commercially pure, $9.00-$11.50; alloy, $11.50; Bar, HR or forged, commercially pure, $7.55-$7.80; alloy, $7.55-$7.75.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Aluminum ingot, 98+%, 10,000 lb. freight alloyed	25.90
Aluminum pig	24.00
Antimony, American, Laredo, Tex.	33.50
Beryllium copper, per lb conta'd Be	$43.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	$74.75
Bismuth, ton lots	$ 2.25
Cadmium, del'd	$ 1.70
Cobalt, 97-99% (per lb)	$2.60 to $2.67
Copper, electro, Conn. Valley	40.00
Copper, Lake, delivered	40.00
Gold, U. S. Treas., per troy oz.	$35.00
Indium, 99.9% dollars per troy oz.	$ 2.25
Iridium, dollars per troy oz.	$100 to $120
Lead, St. Louis	15.80
Lead, New York	16.00
Magnesium, 99.8+%, f.o.b. Velasco, Tex., 10,000 lb, pig	33.75
ingot	34.50
Magnesium, sticks, 100 to 500 lb	56.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$255 to $257
Nickel electro	64.50
Nickel oxide sinter at Copper Cliff, Ont., contained nickel	60.75
Palladium, dollars per troy oz.	$23 to $24
Platinum, dollars per troy oz.	$103 to $105
Silver, New York, cents per troy oz.	90.125
Tin, New York	100.25*
Titanium sponge, grade A-1, $2.70 to $3.00	
Zinc, East St. Louis	13.50
Zinc, New York	14.00
Zirconium sponge	$10.00

*Tentative.

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot	
No. 115	37.75
No. 120	36.50
No. 123	35.00
80-10-10 ingot	
No. 305	41.00
No. 315	39.25
88-10-2 ingot	
No. 210	52.75
No. 215	48.50
No. 245	43.50
Yellow ingot	
No. 405	29.75
Manganese bronze	
No. 421	32.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper max.	26.75-27.75
0.60 copper max.	26.50-27.50
Piston alloys (No. 122 type)	26.00-27.00
No. 12 alum. (No. 2 grade)	25.25-26.25
108 alloy	25.50-26.50
195 alloy	26.50-27.50
13 alloy (0.60 copper max.)	26.50-27.50
AXS-679	25.50-26.25

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½%	25.00-26.00
Grade 2—92-95%	24.00-25.00
Grade 3—90-92%	23.00-24.00
Grade 4—85-90%	22.50-23.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	36	35¼
Yellow brass	27½	25½
Red brass	31⅞	31¼
Comm. bronze	33½	32⅝
Mang. bronze	25¼	24½
Yellow brass rod ends	27	....

Custom Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	34
No. 2 copper wire	32½
Light copper	30
*Refinery brass	30

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	34
No. 2 copper wire	32½
Light copper	30
No. 1 composition	27½
No. 1 comp. turnings	27
Hvy. yellow brass solids	18½
Brass pipe	19
Radiators	21½
Aluminum	
Mixed old cast	16 —17
Mixed new clips	17½—18½
Mixed turnings, dry	17 —18

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire	30½—31
No. 2 copper wire	28 —28½
Light copper	25½—26
Auto radiators (unsweated)	17½—18
No. 1 composition	23½—24
No. 1 composition turnings	22½—23
Unlined red car boxes	18½—19½
Cocks and faucets	19 —19½
Clean heavy yellow brass	16 —16½
Brass pipe	21 —21½
New soft brass clippings	22½—23
No. 1 brass rod turnings	20 —20½

Aluminum

Alum. pistons and struts	7 — 7½
Aluminum crankcases	12 —12½
1100 (2S) aluminum clippings	15½—16
Old sheet and utensils	12 —12½
Borings and turnings	8½— 9
Industrial castings	12 —12½
2024 (24S) clippings	13½—14

Zinc

New zinc clippings	7½— 8
Old zinc	4½— 5
Zinc routings	2¾— 3
Old die cast scrap	2½— 2¾

Nickel and Monel

Pure nickel clippings	$1.65-$1.90
Clean nickel turnings	$1.50
Nickel anodes	$1.65-$1.90
Nickel rod ends	$1.65-$1.90
New Monel clippings	75-85
Clean Monel turnings	60-70
Old sheet Monel	65-75
Nickel silver clippings, mixed	21
Nickel silver turnings, mixed	18

Lead

Soft scrap lead	12½—13
Battery plates (dry)	7 — 7¼
Batteries, acid free	4½

Miscellaneous

Block tin	80 —81
No. 1 pewter	62½—63
Auto babbitt	42 —42½
Mixed common babbitt	13 —13½
Solder joints	18 —18½
Siphon tops	42
Small foundry type	15½—15½
Monotype	14½—15
Lino. and stereotype	13 —13½
Electrotype	12½—12¾
Hand picked type shells	10 —10½
Lino. and stereo. dross	5½— 5¾
Electro. dross	4½— 4½

IRON AGE

STEEL PRICES

(Effective July 31, 1956)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$96.00 *B3*		4.65 *B3*	6.80 *B3*	4.65 *B3*						
	Buffalo, N. Y.	$68.50 *B3*	$84.50 *R3, B3*	$96.00 *R3, B3*	5.45 *B3*	4.65 *B3*	6.80 *B3*	4.65 *B3*	4.325 *R3,B3*	6.25 *B3* 6.25 *R7,S10*	6.825 *B3*	9.10 *B3*		
	Claymont, Del.													
	Harrison, N. J.													13.45 *C11*
	Conshohocken, Pa.								4.775 *A2*	6.70 *A2*	6.825 *A2*			
	New Bedford, Mass.									6.70 *R6*				
	Johnstown, Pa.	$68.50 *B3*	$84.50 *B3*	$96.00 *B3*		4.65 *B3*	6.80 *B3*							
	Boston, Mass.									6.80 *T8*				13.80 *T8*
	New Haven, Conn.									7.30 *D1* 6.70 *At*				
	Phoenixville, Pa.					5.15 *P2*		5.15 *P2*						
	Sparrows Pt., Md.								4.325 *B3*	6.25 *B3*	6.425 *B3*	9.10 *B3*		
	Bridgeport, Wallingford, Conn.	$73.50 *N8*	$89.50 *N8*						4.625 *N8*	6.70 *W1*			7.50 *N8*	
	Pawtucket, R. I. Worcester, Mass.									6.80 *N7, A5*				13.80 *A5, N7*
MIDDLE WEST	Alton, Ill.								4.50 *L1*					
	Ashland, Ky.								4.325 *A7*					
	Canton-Massillon, Dover, Ohio		$86.50 *R3*	$96.00 *R3*						6.85 *G4*				13.45 *G4*
	Chicago, Ill.	$68.50 *U1*	$84.50 *R3, U1* 89.50 *W8*	$96.00 *R3, U1* $101.00 *W8*	5.45 *U1*	4.60 *U1,* 4.85 *W8*	6.74 *U1, Y1*	4.60 *U1*	4.725 *A1* 4.575 *W8* 4.325 *N4*	6.35 *T8* 6.95 *A1*			7.45 *W8*	13.45 *T8*
	Cleveland, Ohio									6.25 *A5,J3*		9.30 *A5*		13.45 *A5*
	Detroit, Mich.			$96.00 *R5*					4.425 *G3,M2*	6.35 *D2,G3, M2,P11* 6.95 *D1*	6.525 *G3*	9.20 *D2, G3*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$68.50 *U1*	$84.50 *U1*	$96.00 *U1, Y1*	6.45 *I3*	4.60 *U1* *I3*	6.75 *U1, I3*		4.325 *I3, U1,Y1*	6.35 *I3* 6.25 *Y1*	6.425 *I3, U1,Y1*	9.30 *Y1*	7.20 *Y1, U1*	
	Sterling, Ill.								4.425 *N4*					
	Indianapolis, Ind.									6.40 *C5*				
	Newport, Ky.												7.20 *N5*	
	Middletown, Ohio									6.45 *A7*				
	Niles, Warren, Ohio Sharon, Pa.		$94.50 *C10*	$106.00 *C10*					4.325 *S1, R3*	6.25 *S1, R3,T4*	6.425 *S1, R3*	9.10 *S1, R3*	7.20 *S1*	13.45 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$68.50 *U1, J3*	$84.50 *J3, U1,C11*	$96.00 *U1, C11*	5.45 *U1*	4.60 *U1,* *J3*	6.75 *U1, J3*	4.60 *U1*	4.325 *P6*	6.25 *S7,B4*			7.20 *S9*	13.45 *S9*
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.					4.60 *W3*			4.325 *W3*	6.25 *F3,W3*	6.425 *W3*	9.10 *W3*		
	Youngstown, Ohio			$96.00 *Y1, C10*			6.75 *Y1*		4.325 *U1, Y1*	6.25 *Y1,C5*	6.425 *U1, Y1*	9.30 *Y1*	7.20 *U1, Y1*	13.45 *C5*
WEST	Fontana, Cal.	$82.50 *K1*	$100.50 *K1*	$127.00 *K1*		5.30 *K1*	7.90 *K1*	5.90 *K1*	5.575 *K1*	8.70 *K1*	8.025 *K1*		9.65 *K1*	
	Geneva, Utah		$84.50 *C7*			4.60 *C7*	6.75 *C7*							
	Kansas City, Mo.					4.70 *S2*	6.85 *S2*				6.675 *S2*		7.45 *S2*	
	Los Angeles, Torrance, Cal.		$94.00 *B2*	$116.00 *B2*		5.30 *C7, B2*	7.45 *B2*		5.875 *C7 B2*	8.90 *C1*			8.40 *B2*	
	Minnequa, Colo.					4.90 *C6*			5.425 *C6*					
	Portland, Ore.					5.35 *O2*								
	San Francisco, Niles, Pittsburgh, Cal.		$94.00 *B2*			5.25 *B2, P9*	7.40 *B2*		5.875 *B2, C7*					
	Seattle, Wash.		$98.00 *B2*			5.35 *B2*	7.50 *B2*		5.325 *B2*					
SOUTH	Atlanta, Ga.								4.525 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$68.50 *T2*	$84.50 *T2*			5.10 *C16* 4.60 *R3,T2*	6.75 *T2*		4.325 *R3,T2* 4.825 *C10*		6.425 *T2*			
	Houston, Lone Star, Texas	$74.50 *L3*	$89.50 *S2*	$101.00 *S2*		4.70 *S2*	6.85 *S2*				6.675 *S2*		7.45 *S2*	

STEEL PRICES

(Effective July 31, 1956)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized *19* ga.	Enameling *12* ga.	Long Terne *18* ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled *19* ga.		Cokes* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Holloware Enameling *29* ga.
EAST	Bethlehem													
	Buffalo, N. Y.	4.325 *B3*	5.325 *B3*				6.375 *B3*	7.875 *B3*			5.375 *W6*	† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25-lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.775 *A2*	4.775 *A2*				6.825 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										5.375 *B3*			
	Fairless, Pa.	4.375 *U1*	5.375 *U1*				6.425 *U1*	7.925 *U1*				$9.70 *U1*	$8.40 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.325 *B3*	5.325 *B3*	5.85 *B3*			6.375 *B3*	7.875 *B3*	8.60 *B3*		5.475 *B3*	$9.70 *B3*	$8.40 *B3*	
	Worcester, Mass.										5.675 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										5.55 *L1*			
	Ashland, Ky.	4.325 *A7*		5.85 *A7*	5.90 *A7*									
	Canton-Massillon, Dover, Ohio			5.85 *R1, R3*										
	Chicago, Joliet, Ill.	4.725 *A1* 4.575 *W8*					6.375 *U1*				5.375 *N4* 5.375 *A5,R3*			
	Sterling, Ill.										5.475 *N4*			
	Cleveland, Ohio	4.325 *J3, R3*	5.325 *J3, R3*		5.90 *R3*		6.375 *J3, R3*	7.875 *J3, R3*			5.375 *A5*			
	Detroit, Mich.	4.425 *G3, M2*	5.425 *G3* 5.325 *M2*				6.475 *G3*	7.975 *G3*						
	Newport, Ky.	4.725 *N5*	5.925 *N5*	5.85 *N5*										
	Gary, Ind. Harbor, Indiana	4.325 *I3, U1,Y1*	5.325 *I3, U1,Y1*	5.85 *U1, I3*	5.90 *U1, I3*	6.25 *U1*	6.375 *Y1, U1,I3*	7.875 *U1, Y1*			5.375 *Y1*	$9.60 *U1,Y1*	$8.30 *I3, U1,Y1*	6.65 *U1, Y1*
	Granite City, Ill.	4.95 *G2*	6.025 *G2*	6.65 *G2*	6.60 *G2*								$8.40 *G2*	7.25 *G2*
	Kokomo, Ind.			6.35 *C9*							5.825 *C9*			
	Mansfield, Ohio	4.325 *E2*	5.325 *E2*			6.25 *E2*								
	Middletown, Ohio		5.325 *A7*	5.85 *A7*	5.90 *A7*	6.25 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	4.325 *S1, R3,N3*	5.325 *R3, N3*	5.85 *R3* 6.85 *N3*	5.90 *N3*	6.25 *N3*	6.375 *S1, R3*	7.875 *R3*					$8.30 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.325 *J3, U1,P6*	5.325 *J3, U1,P6*	5.85 *U1*	5.90 *U1, A7*		6.375 *J3, U1*	7.875 *U1*	8.60 *U1*		5.025 *P6* 5.375 *A5*	$9.60 *J3, U1*	$8.30 *J3, U1*	6.65 *U1*
	Portsmouth, Ohio	4.725 *P7*	5.925 *P7*								5.725 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.325 *W3, W5*	5.325 *W3, W5,F3*	5.85 *W3, W5*		6.25 *W3, W5*	6.375 *W3*	7.875 *W3*				$9.60 *W3, W5*	$8.30 *W3, W5*	6.65 *F3, W5*
	Youngstown, Ohio	4.325 *U1, Y1*	5.325 *Y1*		5.90 *Y1*		6.375 *U1, Y1*	7.875 *Y1*			5.375 *Y1*			
WEST	Fontana, Cal.	5.575 *K1*	7.075 *K1*				7.625 *K1*	9.625 *K1*				$10.35	$9.05	$7.75
	Geneva, Utah	4.425 *C7*												
	Kansas City, Mo.										5.825 *S2*			
	Los Angeles, Torrance, Cal.										6.175 *B2*			
	Minnequa, Colo.										5.825 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.025 *C7*	6.275 *C7*	6.60 *C7*							5.675 *C7*	$10.35 *C7*	$9.05 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.325 *R3, T2*	5.325 *T2*	5.85 *R3, T2*			6.375 *T2*			5.625 *R3*	5.825 *R3* 5.375 *T2*	$9.70 *T2*	$8.40 *T2*	
	Houston, Tex.										5.625 *S2*			

IRON AGE

STEEL PRICES

(Effective July 31, 1956)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				5.575 *B3*	7.425 *B3*	6.80 *B3*					
	Buffalo, N. Y.	4.65 *B3,R3*	4.65 *B3,R3*	6.30 *B5*	5.575 *B3,R3*	7.425 *B3,B5*	6.80 *B3*	4.50 *B3,R3*				6.60 *W6*
	Claymont, Del.							5.35 *C4*		6.30 *C4*	6.725 *C4*	
	Coatesville, Pa.							4.80 *L4*		6.30 *L4*	6.725 *L4*	
	Conshohocken, Pa.							4.95 *A2*	6.825		7.175 *A2*	
	Harrisburg, Pa.							5.10 *P2*	5.575 *C3*			
	Hartford, Conn.			6.75 *R3*		7.725 *R3*						
	Johnstown, Pa.	4.65 *B3*	4.65 *B3*		5.575 *B3*		6.80 *B3*	4.50 *B3*		6.30 *B3*	6.725 *B3*	6.60 *B3*
	Fairless, Pa.	4.80 *U1*	4.80 *U1*		5.725 *U1*							
	Newark, N. J.			6.70 *W10*		7.60 *W10*						
	Camden, N. J.			6.55 *P10*								
	Bridgeport, Putnam, Conn.	4.80 *N8*		6.80 *W10*	5.725 *N8*			4.750 *N8*				
	Sparrows Pt., Md.		4.65 *B3*					4.50 *B3*		6.30 *B3*	6.725 *B3*	6.70 *B3*
	Palmer, Worcester, Readville, Mass. Milton, Pa.	5.25 *M7*	5.25 *M7*	6.70 *W11* 6.45 *C14* 6.70 *B5*		7.725 *A5,B5*		4.50 *R3*				6.90 *A5* 6.90 *W6*
	Spring City, Pa.			6.35 *K4*		7.60 *K4*						
MIDLE WEST	Alton, Ill.	4.85 *L1*										6.775 *L1*
	Ashland, Newport, Ky.							4.50 *A7,N5*		6.30 *N5*		
	Canton-Massillon, Mansfield, Ohio	4.75 *R3*		6.25 *R2,R3*	5.575 *R3,T5*	7.425 *R2,R3, T5*		4.50 *E1*				
	Chicago, Joliet, Ill.	4.65 *U1,R3* 4.90 *W8* 5.15 *P13*	4.65 *N4,R3* 5.15 *P13*	6.25 *B5,W10, A5,L2* 6.50 *W8*	5.575 *U1,R3,* 5.825 *W8*	7.425 *A5, W10,L2,B5* 7.675 *W8*		4.50 *U1,I3,R3* 4.90 *A1* 4.75 *W8*	5.575 *U1*	6.30 *U1*	6.725 *U1*	6.60 *A5,R3, N4,W7*
	Cleveland, Ohio	4.65 *R3*	4.65 *R3*	6.25 *A5,C13*		7.425 *A5,C13*	6.80 *R3*	4.60 *J3,R3*	5.575 *J3*		6.725 *R3,J3*	6.60 *A5, C13*
	Detroit, Mich.	4.75 *G3*	4.75 *G3*	5.90 *R5* 6.45 *B5* 6.50 *P3* 6.10 *P8*	5.575 *R5* 5.675 *G3*	7.425 *R5* 7.625 *B5,P3, P8*	6.90 *G3*	4.60 *G3*			6.825 *G3*	
	Duluth, Minn.											6.60 *A5*
	Gary, Ind. Harbor, Crawfordsville	4.65 *I3, U1, Y1*	4.65 *I3, U1, Y1*	6.25 *M5,R3*	5.575 *I3, U1, Y1*	7.425 *M5, R3*	6.80 *U1,I3, Y1*	4.50 *I3, U1, Y1*	5.575 *I3*	6.30 *U1,Y1*	6.725 *U1, I2,Y1*	6.35 *M4*
	Granite City, Ill.							5.15 *G2*				
	Kokomo, Ind.											7.20 *C9*
	Sterling, Ill.	4.75 *N4*	4.75 *N4*									6.70 *N4*
	Niles, Warren, Ohio Sharon, Pa.	4.65 *R3,C10*		6.25 *C10*	6.25 *C10*	7.425 *C10*	6.80 *R3*	4.50 *S1,R3*		6.30 *S1*	6.725 *S1*	
	Pittsburgh, Pa. Midland, Pa.	4.65 *J3, U1, C11*	4.65 *J3, U1*	6.25 *A5,C8, C11,J3, W10,B4,R3*	5.575 *U1,C11*	7.425 *A5,C11, W10,C8,R3*	6.80 *J3, U1*	4.50 *J3, U1*	5.575 *U1*	6.30 *U1*	6.725 *J3, U1*	6.60 *A5,J3, P6*
	Portsmouth, Ohio											7.10 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	4.65 *W3*						4.50 *W3,W5*				
	Youngstown, Ohio	4.65 *U1,Y1, C10,R3*	4.65 *U1,Y1, R3*	6.25 *Y1, U1*	5.575 *U1,Y1, C10*	7.425 *Y1,C10, F2*	6.80 *U1,Y1*	4.50 *U1,Y1, R3*		6.30 *Y1*	6.725 *Y1*	6.60 *Y1*
WEST	Emeryville, Cal.	5.40 *J5*	5.40 *J5*									
	Fontana, Cal.	5.80 *K1*	5.35 *K1*		7.175 *K1*		7.95 *K1*	5.65 *K1*		7.70 *K1*	7.875 *K1*	
	Geneva, Utah							4.50 *C7*			6.725 *C7*	
	Kansas City, Mo.	4.90 *S2*	4.90 *S2*		5.825 *S2*		7.05 *S2*					6.85 *S2*
	Los Angeles, Torrance, Cal.	5.35 *B2,C7*	5.35 *B2,C7*	7.70 *R3*	6.625 *B2*		7.50 *B2*				7.625 *B2*	7.55 *B2*
	Minnequa, Colo.	5.10 *C6*	5.10 *C6*					5.35 *C6*				6.85 *C6*
	Portland, Ore.	5.40 *O2*	5.40 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	5.35 *C7* 5.40 *B2,P9*	5.35 *C7* 5.40 *B2,P9*				7.55 *B2*					7.55 *C7* 7.55 *C6*
	Seattle, Wash.	5.40 *B2,P12, N6*	5.40 *B2,P12*				7.55 *B2*	5.40 *B2*		7.20 *B2*	7.625 *B2*	
SOUTH	Atlanta, Ga.	5.15 *A8*	5.15 *A8*									6.86 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	4.65 *T2,R3* 5.15 *C16*	4.65 *T2,R3* 5.15 *C16*				6.80 *T2*	4.50 *T2,R3*			6.725 *T2*	6.60 *R3,T2*
	Houston, Ft. Worth, Lone Star, Tex.	4.90 *S2*	4.90 *S2*		5.825 *S2*		7.05 *S2*	4.85 *L3* 4.60 *S2*		6.40 *S2*	6.825 *S2*	6.85 *S2*

Steel Prices *(Effective July 31, 1956)*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdeboro, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metals Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.
D5 Henry Disston Div., Philadelphia

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.
F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J
P11 Production Steel Strip Corp., Detroit
P12 Pacific Steel Rolling Mills, Seattle
P13 Phoenix Mfg. Co., Joliet, Ill.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass.
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $290 per net ton.

	BUTTWELD														SEAMLESS							
	⅛ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75								
Youngstown *R3*	18.50	1.25	21.50	5.25	24.00	8.75	26.50	10.00	27.00	11.00	27.50	11.50	29.00	11.75								
Fontana *K1*	6.00	13.25	9.00	+9.25	11.50	+5.75	14.00	+4.00	14.50	+3.00	15.00	+2.50	16.50	+1.75								
Pittsburgh *J3*	18.50	1.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	4.00	+11.	10.50	+6.25	13.00	+3.75	14.50	+2.25
Alton, Ill. *L1*	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75								
Sharon *M3*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75								
Fairless *N2*	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75								
Pittsburgh *N1*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	4.00	+11.	10.50	+6.25	13.00	+3.75	14.50	+2.25
Wheeling *W5*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75								
Wheatland *W4*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75								
Youngstown *Y1*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	4.00	+11.	10.50	+6.25	13.00	+3.75	14.50	+2.25
Indiana Harbor *Y1*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.00	26.00	11.50	26.50	12.00	28.00	11.75								
Lorain *N2*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	4.00	+11.	10.50	+6.25	13.00	+3.75	14.50	+2.25
E&TRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75								
Youngstown *R3*	23.00	7.25	27.00	11.25	29.00	14.75	29.50	14.00	30.00	15.00	30.50	15.50	31.00	14.75								
Fairless *N2*	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75								
Fontana *K1*	16.50		14.50		16.50		17.00		17.50		18.00		18.50									
Pittsburgh *J3*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	5.50	+8.50	13.00	+2.75	15.50	+0.25	20.50	4.75
Alton, Ill. *L1*	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75								
Sharon *M3*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75								
Pittsburgh *N1*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	305.0	17.00	31.00	15.75	5.50	+8.50	13.00	+2.75	15.50	+0.25	20.50	4.75
Wheeling *W5*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75								
Wheatland *W4*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75								
Youngstown *Y1*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	5.50	+8.50	13.00	+2.75	15.50	+0.25	20.50	4.75
Indiana Harbor *Y1*	22.00	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75								
Lorain *N2*	21.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	5.50	+8.50	13.00	+2.75	15.50	+0.25	20.50	4.75

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.50¢ per lb.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.60	T-1
18	4	1	—	5	1.305	T-4
18	4	2	—	—	1.765	T-2
1.5	4	1.5	8	—	.96	M-1
6	4	2	6	—	1.35	M-2
6	4	3	5	—	1.105	M-3

High-carbon chromium.. .77 D-3, D-5
Oil hardened manganese .42 O-2
Special carbon .39 W-1
Extra carbon .33 W-1
Regular carbon .275 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

Stainless Type	Cladding	Plate (A3, J2, L4) 10 pct	Plate (A3, J2, L4) 15 pct	Plate (A3, J2, L4) 20 pct	Sheet (I2) 20 pct
304		30.30	33.15	36.05	32.50
316		35.50	38.45	41.40	47.00
321		32.00	34.85	37.75	37.25
347		34.40	37.90	41.40	48.25
405		25.80	29.60	33.35	.....
410, 430		25.30	29.10	32.85	.....

CR Strip (B9) Copper, 10 pct, 2 sides, 42.15; 1 side, 33.40.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	9.00	8.60	.....
Armature	9.95	9.60	10.10
Elect.	10.55	10.20	10.70
Motor	11.55	11.20	11.70
Dynamo	12.45	12.10	12.60
Trans. 72	12.80	13.05	13.55
		Grain Oriented	
Trans. 65	13.35	Trans. 80	17.45
Trans. 58	13.85	Trans. 73	17.95
Trans. 52	14.85		

Producing points: Beech Bottom (W5); Brackenridge (A3); Granite City (G2); Indiana Harbor (I3); Mansfield (E2); Newport, Ky. (N5); Niles, O. (N3); Vandergrift (U1); Warren, O. (R3); Zanesville (A7).
* Coils 75¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1956 season. Freight charges for seller's account.

	Gross Ton
Openhearth lump	$12.10
Old range, bessemer	11.35
Old range, nonbessemer	11.10
Mesabi, bessemer	11.00
Mesabi, nonbessemer	10.85
High phosphorus	10.85

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Cal	Woven Wire Fence 9-15½ ga. Cal	"T" Fence Posts Cal	Single Loop Bale Ties Cal	Galv. Barbed and Twisted Barbless Wire Cal	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City R3	152	162	...	173	175	7.40	7.80
Aliquippa, Pa. J3	152	162	...	...	...	7.40	7.80
Atlanta A8	154	167	...	177	180	7.60	8.12½
Bartonville K2*	169	184	...	195	197	8.10	8.70
Buffalo W6	...	...	...	...	...	7.50	7.90
Chicago, Ill. N4**	152	166	...	175	179	7.50	8.10
Cleveland A6	157	...	...	...	...	7.50	.....
Cleveland A5	...	...	...	...	...	7.40	.....
Crawfordsville M4*	154	168	...	177	181	7.60	8.20
Donora, Pa. A5	152	162	...	175	175	7.50	7.90
Duluth A5	152	162	...	175	175	7.50	7.90
Fairfield, Ala. T2	152	162	...	175	175	7.50	7.90
Galveston D4	157	...	...	...	...	...	.....
Houston S2	157	170	...	...	180	7.65	8.05
Johnstown, Pa. B3*	152	166	...	...	175	7.40	7.80
Joliet, Ill. A5	152	162	...	175	175	7.50	8.10
Kokomo, Ind. C9	169	180	...	195	193	8.10	8.50
Los Angeles B2*	...	...	...	...	...	8.35	8.92½
Kansas City S2	157	167	...	178	180	7.65	8.05
Minnequa C6	157	167	162	180	180	7.75	8.15
Monessen P6	152	162	...	...	...	7.40	7.80
Moline, Ill. R3	...	162	162	...	...	...	.....
Pittsburg, Cal. C7	171	185	...	199	195	8.45	8.85
Portsmouth P7	...	...	...	...	...	8.00	.....
Rankin, Pa. A5	152	162	...	...	175	7.40	7.90
So. Chicago R3	152	162	157	173	175	7.40	7.80
S. San Francisco C6	...	...	...	197	195	8.35	8.75
Sparrows Pt. B3*	154	...	...	175	181	7.60	8.20
Struthers, O. Y1	...	...	...	...	...	7.50	8.00
Worcester A5	158	...	...	...	...	7.70	8.20
Williamsport, Pa. S5	...	...	160	...	...	.....	.....

Galvanized products computed with zinc at 5¢ per lb Exceptions: *zinc at 12.5¢ per lb; ** 13¢ zinc.

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery Charge ‡	Sheets Hot-Rolled	Sheets Cold-Rolled	Sheets Galvanized (10 gage)	Strip Hot-Rolled	Strip Cold-Rolled	Plates	Shapes Standard Structural	Bars Hot-Rolled	Bars Cold-Finished	Alloy Bars Hot-Rolled 4615 As Rolled	Alloy Bars Hot-Rolled 4140 Annealed	Alloy Bars Cold-Drawn 4615 As rolled	Alloy Bars Cold-Drawn 4140 Annealed
Baltimore	$.10	7.31	8.32	8.37	7.65	.....	7.63	7.93	7.61	8.62	14.38	13.44-13.96	16.36	16.29-16.49
Birmingham	.15	6.80-7.63	7.93-8.50	8.85	7.86-7.71	.....	6.99-7.95	7.28-7.93	7.08-7.77	9.35	.....	.....	.....	.....
Boston	.10	8.22-8.72	9.17-9.57	10.42-10.92	8.31-8.81	11.10	8.51-9.01	8.37-8.87	8.37-8.81	9.96-10.46	14.65-14.81	14.10-14.26	17.61	17.31
Buffalo	.15	7.85	8.65	10.66	8.00	.....	8.30	8.25	8.00	8.55	14.70	14.15	17.50	17.20
Chicago	.15	7.78	8.64	9.75	7.86	9.55	8.10	8.08	7.92	8.40	14.35	13.80	17.15	16.85
Cincinnati	.15	7.90	8.63	9.75	8.10	.....	8.39	8.55	8.16	8.80	14.60	14.05	17.40	17.10
Cleveland	.15	7.28-7.78	8.39-8.64	9.10-9.60	7.46-7.96	.....	7.77-8.27	7.91-8.41	7.48-7.98	8.15-8.65	13.41-14.41	13.36-13.86	16.26-17.20	16.41-16.91
Denver		8.60	10.76	11.22	8.90	.....	8.60	8.75	8.90	9.82	.....	.....	.....	17.97
Detroit	.15	7.97	8.83	10.03	8.14	.....	8.38	8.55	8.20	8.69	14.59	14.04	17.39	17.09
Houston		7.85	8.75	10.49	8.15	.....	8.00	8.20	8.25	10.10-9.95	14.35	15.90	17.15	17.05
Kansas City	.20	8.45	9.31	10.42	8.53	.....	8.77	8.75	9.12	9.32	15.02	14.47	17.82	17.52
Los Angeles	.10	8.25	10.10	11.10	8.60	.....	8.85	8.40	8.25	11.00	.....	14.50	.....	18.10
Memphis	.10	8.10	8.96	.....	8.18	.....	8.42	8.40	9.05	9.65	.....	.....	.....	.....
Milwaukee	.15	7.37-7.87	8.48-8.73	9.34-9.84	7.45-7.95	.....	7.69-8.19	7.75-8.25	7.51-8.01	8.09-8.59	14.54	13.39-13.89	17.24	16.44-16.94
New Orleans	.15	7.20	8.35	.....	7.45	.....	7.40	7.70	7.50	9.55	.....	.....	.....	.....
New York	.10	8.38	9.23	10.23	8.88	.....	8.81	8.71	8.76	10.37	14.72	14.17	17.52	17.22
Norfolk	.20	7.25	.....	.....	7.65	.....	7.45	7.95	7.65	9.50	.....	.....	.....	.....
Philadelphia	.10	7.44-7.94	8.54-9.04	9.51-10.01	8.09-8.59	.....	7.82-8.32	7.85-8.35	8.33	8.62-9.12	14.50	13.45-13.95	17.30	16.50-17.00
Pittsburgh	.15	7.78	8.89	10.05	7.96	9.50**	8.10	8.08	7.92	8.65	14.35	13.80	17.15	16.85
Portland		7.80-8.60	8.80-10.15	10.65	8.00	7.95	7.75	7.85-8.15	7.95	12.20	.....	15.00	.....	17.50
Salt Lake City	.20	8.60	10.60	.....	9.35	.....	.....	9.20	9.15	.....	.....	.....	.....	.....
San Francisco	.10	8.30	9.75	10.75	8.45	.....	8.40	8.35	8.25	11.55	.....	14.50	.....	18.10
Seattle	.00	8.75	10.50	10.90	8.90	.....	8.50	8.50	8.60	12.25	.....	14.75	.....	17.80
St. Louis	.15	8.07	8.93	10.04	8.15	.....	8.39	8.48	8.21	8.94	14.64	14.09	17.44	17.14
St. Paul	.25	8.48	9.18	10.45	8.56	.....	8.80	8.78	7.74	9.35	15.05	14.50	17.85	17.55

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

Exceptions. (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) $.25 delivery. (4) 1000 to 1999 lb, $.35 delivery.

*Plus analysis charge. ‡Deduct for country delivery.

** F.O.B. Plant, warehouse price.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Bristol, Conn. W12	.....	.....	10.90	13.05	15.75
Buffalo, N. Y. R7	7.00	8.95	10.50	12.65	15.35
Carnegie, Pa. S9	.....	9.85	10.60	12.75	15.35
Cleveland A5	7.10	9.05	10.60	12.75	15.45
Detroit D1	7.20	9.15	10.70	12.85	.....
Detroit D2	7.20	9.15	10.70	.....	.....
Harrison, N. J. C11	.....	.....	10.90	13.05	15.75
Indianapolis C5	7.15	9.10	10.50	12.65	15.35
New Castle, Pa. B4	7.00	8.95	10.50	12.65	.....
New Haven, Conn. D1	7.55	9.35	10.90	13.05	.....
Pawtucket, R. I. N7	7.65	9.35	10.90	13.05	15.75
Pittsburgh S7	7.10	9.05	10.60	12.75	15.45
Riverdale, Ill. A1	7.20	9.05	10.60	12.75	15.45
Sharon, Pa. S1	7.10	9.05	10.60	12.75	15.45
Trenton R4	.....	.....	.....	.....	.....
Wallingford W1	7.55	9.35	10.90	13.05	15.75
Warren, Ohio T4	7.00	8.95	10.50	12.65	15.35
Weirton, W. Va. W3	7.10	8.95	10.50	.....	.....
Worcester, Mass. A5	7.65	9.35	10.90	13.05	15.75
Youngstown C5	7.00	8.95	10.50	12.65	15.35

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	32.09	37.37	29.93	.....
	2½	12	43.22	50.31	40.31	.....
	3	12	49.90	58.10	46.55	.....
	3½	11	58.26	67.83	54.34	.....
	4	10	77.36	90.07	72.17	.....
National Tube	2	13	32.09	37.37	29.93	.....
	2½	12	43.22	50.31	40.31	.....
	3	12	49.90	58.10	46.55	.....
	3½	11	58.26	67.83	54.34	.....
	4	10	77.36	90.07	72.17	.....
Pittsburgh Steel	2	13	32.09	37.37	.....	.....
	2½	12	43.22	50.31	.....	.....
	3	12	49.90	58.10	.....	.....
	3½	11	58.26	67.83	.....	.....
	4	10	77.36	90.07	.....	.....

(Effective July 31, 1956)

RAILS, TRACK SUPPLIES

F.o.b. Mi Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Unbreated
Bessemer *U1*	4.725	5.65	5.825				
So.[Chicago *R3*				8.05			
Ensley *T2*	4.725	5.65					
Fairfield *T2*		5.65		8.05		5.625	
Gary *U1*	4.725	5.65				5.625	
Ind. Harbor *I3*	4.725		5.825	8.05		5.625	
Ind. Harbor *Y1*				8.05			
Johnstown *B3*		5.65					
Joliet *U1*			5.825				
Kansas City *S2*				7.90			
Lackawanna *B3*	4.725	5.65	5.825			5.625	
Lebanon *B3*							12.15
Minnequa *C6*	4.725	6.15	5.825	7.90		5.625	12.15
Pittsburgh *O1*					11.90		12.15
Pittsburgh *P5*							12.15
Pittsburgh *J3*				8.05			
Seattle *B2*				8.40		5.775	12.65
Steelton *B3*	4.725		5.825			5.625	
Struthers *Y1*				8.05			
Torrance *C7*						5.775	
Williamsport *S5*		5.65					
Youngstown *R3*				8.05			

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.50
Foundry, beehive (f.o.b. oven)	$17.00 to $18.00
Foundry, oven coke	
Buffalo, del'd	$28.75
Chicago, f.o.b.	27.00
Detroit, f.o.b.	27.50
New England, del'd	28.55
Seaboard, N. J., f.o.b.	26.75
Philadelphia, f.o.b.	26.50
Swedeland, Pa., f.o.b.	26.50
Painesville, Ohio, f.o.b.	27.50
Erie, Pa., f.o.b.	27.50
Cleveland, del'd	29.42
Cincinnati, del'd	28.59
St. Paul, f.o.b.	26.50
St. Louis, f.o.b.	28.50
Birmingham, f.o.b.	25.65
Lone Star, Tex., f.o.b.	19.50

ELECTRODES

Cents per lb f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	84	23.00	40	100, 110	9.90
20	72	22.25	35	110	9.90
16 to 18	72	22.50	30	110	10.05
14	72	23.00	24	72 to 84	10.30
12	72	23.50	20	90	10.10
10	60	24.75	17	72	10.35
7	60	24.50	14	72	10.85
5	60	27.25	12	60	11.75
4	40	30.25	10	60	11.80
3	40	32.00	8	60	12.10
2½	30	33.75			
2	24	52.50			

* Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Cast elliptical, 18 in. or longer, 5000 lb lots	62.92
Electrodeposited	50.28
Brass, 80-20, ball anodes, 2000 lb or more	60.00
Zinc, ball anodes, 2000 lb lots (for elliptical add 2¢ per lb)	21.25
Nickel, 99 pct plus, rolled carbon (rolled depolarized add 3¢ per lb)	90.50
Cadmium	$1.70
Tin, ball anodes and elliptical	$1.06 to $1.10

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	80.50
Copper sulphate, 5 or more 100 lb bags, per cwt.	27.15
Nickel salts, single, 4-100 lb bags	38.25
Nickel chloride, freight allowed, 300 lb	46.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums (Philadelphia price 22.60)	22.35
Zinc cyanide, 100 to 900 lb	55.55
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 1 to 20 100 lb drums	29.25

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolt

	Discounts Full case	Full case 20,000 lb Quantity or more
½ in. & smaller x 6 in. & shorter	61	63
Larger than ½ in. diam. and all diam. longer than 6 in.	55	57
Rolled thread carriage bolts ½ in. & smaller x 6 in. and shorter	61	63
Lag, all diam. x 6 in. & shorter	61	63
Lag, all diam. longer than 6 in.	55	57
Plow bolts	61	63

Nuts, Hex, HP, reg. & hvy.

¾" or smaller	64	66
⅞" to 1¼" inclusive	63	65
1⅛" to 1½" inclusive	65	67
1⅝" and larger	61	63

C.P. Hex, regular & hvy.

¾" or smaller	64	66
⅞" and larger	61	63

Hot Galv. Nuts (all types)

1½" or smaller	44	47

Finished, Semi-finished, Hex Nuts

¾" and smaller	66	66
⅞" and airger	63	63

Add 25% for less than case or keg quantity.

Rivets

	Base per 100 lb
½ in. and larger	$9.95
	Pct Off List
7/16 in. and smaller	32

Cap Screws

	Discount	*H.C. Heat*
Bright Treated		
New std. hex head, packaged		
¼" thru ½" diam. x 6" and shorter	34	20
9/16" and ⅝" x 6" and smaller and shorter	31	16
¾", ⅞", 1" x 6" and shorter	9	+11
¼" thru ½" diam. x 6" and shorter	49	41
9/16" and ⅝" diam. x 6" and shorter	43	39
¾", ⅞", 1" x 6" and shorter	31	20

*Minimum quantity per item:
15,000 pieces ¼", 5/16", ⅜" diam.
5,000 pieces 7/16", ½", 9/16", ⅝" diam.
2,000 pieces ¾", ⅞", 1" diam.

Machine Screws & Stove Bolts

	Discount Mach. Screws	Stove Bolts
Packaged, package list	27	38
Bulk, bulk list		
Quantity		
¼-in. diam. & under } 25,000-200,000	20	61
5/16-in. diam. & larger } 15,000-100,000	20	61
All diam. over 3 in. long } 5,000-100,000	—	61

Machine Screw & Stove Bolt Nuts

	Discount Hex	Square
Packaged, package list	24	27
Bulk, bulk list		
Quantity		
¾-in. diam. & smaller } 25,000-200,000	18	20

CAST IRON WATER PIPE INDEX

Birmingham	119.0
New York	131.4
Chicago	133.4
San Francisco-L. A.	140.2

Dec. 1955 value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1 issue. Source: U. S. Pipe and Foundry Co.

REFRACTORIES

Fire Clay Brick *Carloads per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$128.00
No. 1 Ohio	128.00
Sec. quality, Pa., Md., Ky., Mo., Ill.,	114.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	20.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$140.00
Childs, Hays, Pa.	145.00
Chicago District	150.00
Western Utah	144.00-165.00
California	170.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	150.00-157.00
Silica cement, net ton, bulk, Latrobe	26.50
Silica cement, net ton, bulk, Chicago	24.00
Silica cement, net tons, bulk, Ensley, Ala.	25.50
Silica cement, net ton, bulk, Mt. Union	23.00
Silica cement, net ton, bulk, Utah and Calif.	35.00

Chrome Brick *Per net ton*

Standard chemically bonded, Balt.	$98.00
Standards chemically bonded, Curtiner, Calif.	108.00
Burned, Balt.	92.00

Magnesite Brick

Standard Baltimore	$121.00
Chemically bonded, Baltimore	109.00

Grain Magnesite St. ⅜ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk.	$69.40
Domestic, f.o.b. Chewalah, Wash., Luning, Nev.	
in bulk	43.00
in sacks	49.00

Dead Burned Dolomite *Per net ton*

F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio	$15.00
Midwest	15.60
Missouri Valley	14.00

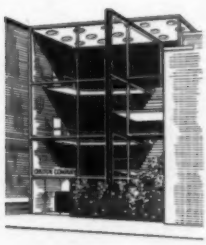
METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh

Swedish sponge iron f.o.b. Riverton, N. J., ocean bags	8.50¢
Canadian sponge iron, Del'd in East, carloads	9.5¢
Domestic sponge iron, 98+% Fe, carload lots	8.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	22.0¢
Carbonyl iron size 5 to 10 micron, 98%, 00.8+% Fe	86.0¢ to $1.55
Aluminum freight allowed	38.00¢
Brass, 10 ton lots	37.50¢ to 50.00¢
Copper, electrolytic	59.50¢
Copper, reduced	59.50¢
Cadmium, 100-199 lb, 95¢ plus metal value	
Chromium, electrolytic 99.85% min. Fe .03 max. Del'd	$5.00
Lead	8.90¢ plus metal value
Manganese	70.0¢
Molybdenum, 99%	$3.00 to $3.25
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed #80	$1.13
Silicon	43.50¢
Solder powder	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	99.0¢
Stainless steel, 316	$1.32
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$4.50
Zinc, 10 ton lots	18.75¢ to 32.50¢

Postgraduate

Modern business publications provide postgraduate courses that make a definite and invaluable contribution to the progress of an industry and the people engaged in it. Not only do they convey and interpret the news and provide a sounding board for the opinions of industry leaders, but they actually teach what must be learned to keep abreast of competition. That's why you will find that the men at the top in their fields—or headed there—are staunch supporters and avid readers of their industry's business publications. And again that's why it pays to advertise in those publications.



Chilton
COMPANY

Chestnut and 56th Streets • Philadelphia 39, Pennsylvania

CHILTON PUBLICATIONS: Department Store Economist • The Iron Age • Hardware Age • Spectator • Hardware World Jewelers' Circular-Keystone • Automotive Industries • Gas • Distribution Age • Optical Journal and Review of Optometry Motor Age • Boot and Shoe Recorder • Commercial Car Journal • Butane-Propane News • Electronic Industries • Book Division

Ferroalloy Prices

(Effective July 31, 1956)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk carloads, del'd, 67-71% Cr, .30-1.00% max. Si.

0.02% C	39.25	0.30% C	36.25
0.03% C	38.75	0.50% C	36.00
0.06% C	37.25	1.00% C	35.25
0.10% C	36.75	1.50% C	35.10
0.15% C	36.50	2.00% C	35.00

4.00-4.50% C, 67.70% Cr, 1-2% Si.. 26.25
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 25.00
0.025% C (Simplex) 32.50
0.10% C, 50-52% Cr, 2% max Si.... 33.75
8.50% max. C, 50-55% Cr, 3-6% Si.. 22.50
8.50% C, 50-55% Cr, 3% max Si.... 22.50

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.27
0.50% max. C	1.27
9 to 11% C, 88-91% Cr, 0.75% Fe..	1.36

Electrolytic Chromium Metal

Contract prices per lb of metal 2" x D plate (¼" thick) delivered packed. 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	1.25
Ton lots	1.27
Less ton lots	1.29

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.

Carloads	41.85
Ton lots	46.15
Less ton lots	48.65

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.
30-33% Ca, 60-65% Si, 3.00 max. Fe.

Carloads	23.00
Ton lots	26.75
Less ton lots	28.25

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	23.05
Ton lots	24.95
Less ton lots	25.95

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr. 20% Fe ½ in. x 12 mesh.

Ton lots	19.65
Less ton lots	20.90

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19½ Si, 8-11% Mn, packed.

Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11% Ca 5 to 7%.

Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.: Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	10.75
Johnstown, Pa.	10.75
Sheridan, Pa.	10.75
Philo, Ohio	10.75
S. Duquesne	10.75

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	13.00
Ton lots packed	15.20

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$92.00
19 to 21%	3% max.	94.00
21 to 23%	3% max.	96.50

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	31.5
Ton lots	33.5
250 to 1999 lb	35.5
Premium for hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn... 22.85

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 80% Mn	34.00	36.55	37.75
0.07% max. C	31.95	34.50	35.70
0.10% max. C	31.20	33.75	34.95
0.15% max. C	30.45	33.00	34.20
0.30% max. C	28.95	31.50	32.70
0.50% max. C	28.45	31.00	32.20
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	25.45	28.00	29.20

Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carload bulk	13.00
Ton lots	13.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	13.55
Ton lots, packed	15.75

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $100.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots	Carloads
96.50% Si, 2% Fe	22.75	21.45
98% Si, 1% Fe	23.25	21.95

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si. briquets.

Carloads, bulk	7.15
Ton lots, packed	9.75

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bluk, carloads, f.o.b. shipping point.

50% Si	12.75	75% Si	15.40
65% Si	14.50	85% Si	17.10
	90% Si	18.50	

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.

Openhearth	3.10
Crucible	3.20
High speed steel (Primos)	3.30

Alsifer, 20% Al, 40% Si, 40% Fe,

Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80¢

Calcium molybdate, 42.6-46.6%

f.o.b Langeloth, Pa., per pound Contained Mo $1.34

Ferrocolumbium, 50-60%, 2 in.

x D contract basis, delivered per pound contained Cb.

Ton lots	$6.90
Less ton lots	6.95

Ferro-tantalum-columbium, 20%

Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb con't Sb plus Ta..... $4.65

Ferromolybdenum, 55-75%, 200-lb

containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.54

Ferrophosphorus, electric, 23-

26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload..... $110.00

Ferrotitanium, 40% regular grade,

0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon,

0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.55

Ferrotitanium, 15 to 18% high

carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton $200.00

Ferrotungsten, ¼ x down,

packed, per pound contained W, ton lots, delivered $3.45

Molybdic oxide, briquets, per lb

contained Mo, f.o.b. Langeloth, Pa. $1.32
bags, f.o.b. Washington, Pa. Langeloth, Pa. $1.30

Simanal, 20% Si, 20% Mn, 20%

Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk lump	17.50¢
Ton lots, packed lump	19.50¢
Less ton lots	20.00¢

Vanadium oxide, 86-89% V_2O_5

contract basis, per pound contained V_2O_5 ..... $1.33

Zirconium contract basis, per lb

of alloy
35-40% f.o.b. freight allowed, carloads, packed ..... 26.25¢
12-15%, del'd lump, bulk-carloads ..... 8.50¢

Boron Agents

Borosil, contract prices per lb of

alloy del. f.o.b. Philo, Ohio, freight allowed, B 3.14%, Si 40-45%, per lb contained 2 .... $5.25

Bortam, f.o.b. Niagara Falls

Ton lots, per pound ..... 45¢
Less ton lots, per pound .... 50¢

Corbortam, Ti 15-21%, B 1-2%,

Si 2-4%, Al 1-2%, C 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed
Ton lots per pound ..... 14.00¢

Ferroboron, 17.50% min. B, 1.50%

max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots 1.20
F.o.b. Wash., Pa.; Niagara Falls, N. Y., delivered 100 lb up
10 to 14% B ..... .85
14 to 19% B 1.20
19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa.,

freight allowed, 100 lb and over
No. 1 ..... $1.05
No. 79 ..... 50¢

Manganese - Boron, 75.00% Mn.,

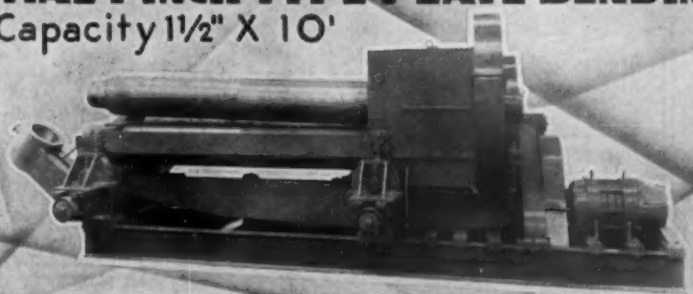
15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.
Ton lots $1.46
Less ton lots 1.57

Nickel-Boron, 15-18% B, 1.00%

max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots $2.05

INITIAL PINCH TYPE PLATE BENDING ROLL

Capacity 1½" X 10'



Our Line
Light and heavy machinery for all classes of sheet metal, plate and structural work.

BERTSCH & COMPANY, CAMBRIDGE CITY • INDIANA

ATLANTIC STEEL PRODUCTS CO.
3000 West Sedgley Ave., Phila. 21, Pa.
From Stock
BARS • STRIP • SHEETS • PLATES

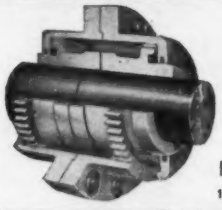
GOSS and DE LEEUW
MULTIPLE SPINDLE
CHUCKING MACHINES
Tool Rotating Type
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

HOT DIP GALVANIZING
JOSEPH P. CATTIE & BROTHERS, INC.
2520 East Hagert St.
Phone: Re 9-8911 Phila. 25, Pa.

---

for Corrugating and Complete Line of Culvert Equipment—Slitting and Coiling Equipment for Ferrous and Non-Ferrous Material in All Capacities—Warehouse and Steel Mill Cut to Length Lines for Shearing and Levelling Sheets from Coils—Shears for Shearing Sheets and Plates Both Underdriven and Overdriven Types in Capacities to 1¼" Plate.

STAMCO, Inc., New Bremen, Ohio



POOLE
FLEXIBLE COUPLINGS
ALL SIZES AND TYPES
CATALOG ON REQUEST
POOLE FOUNDRY & MACHINE CO.
1700 UNION AVE., BALTIMORE 11, MD.

H&G Insert Chaser DIE HEADS

famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

THE EASTERN MACHINE SCREW CORP., 21-41 Barclay Street, New Haven, Conn.
Pacific Coast Representative: *A. C. Behringer, Inc., 334 N. San Pedro St., Los Angeles, California.* Canada: *F. F. Barber Machinery Co., Toronto, Canada*

ARTUS
PLASTIC SLITTING MACHINE SHIMS
COST JUST A FRACTION OF METAL SPACERS
THE COLOR TELLS THE THICKNESS
ALWAYS RETAINS UNIFORMITY AND EVENNESS UNDER ALL NORMAL CONDITIONS
Save Time! Save Money!
INDUSTRIAL PRODUCTS SUPPLIERS 201 South Dean Street Englewood N J

---

more and more manufacturers are saying: "Let's use

GRIFFIN®
COLD ROLLED STRIP STEEL"

Made to your specifications in all thicknesses from .012 to .375 inches and widths from ⅜" to 19" depending upon gauge.

NARROW ROLLED ROUND EDGE STRIP STEEL *In stock at*
CENTRAL STEEL & WIRE CO.
Detroit, Chicago, Cincinnati
Wm. H. LEONORI & CO., Inc.
New York City

GRIFFIN
"since 1899"
MANUFACTURING CO. ERIE, PA.

"DAVIS" KEYSEATER
Low in Cost. Durable. Easy to operate.
Table adjustable for straight or taper keyways.
Three sizes. Keyways 1/16" up to 1".
DAVIS KEYSEATER CO.
400 Exchange St., Rochester 8, N. Y.

A. J. BOYNTON AND CO.
CONSULTING ENGINEERS
109 N. Wabash Ave., Chicago 2, Ill.

RAILWAY EQUIPMENT FOR SALE

Used - As Is - Reconditioned

RAILWAY CARS
All Types

SERVICE-TESTED ®
FREIGHT CAR REPAIR PARTS
For All Types of Cars

LOCOMOTIVES
Diesel, Steam, Gasoline, Diesel-Electric

SPECIAL OFFERING
3—AIR DUMP CARS
(SIDE DISCHARGE)
Magor—30-Cubic Yard, 50-Ton Capacity, Lift Door Type

31—ALL-STEEL ORE CARS, HOPPER TYPE
40 and 50-ton capacity
Excellent condition. Immediate delivery!

RAILWAY TANK CARS and STORAGE TANKS
6,000- 8,000- and 10,000-Gallon
Cleaned and Tested

CRANES
Overhead and Locomotive

IRON & STEEL PRODUCTS, Inc.

General Office
13496 S. Brainard Ave.
Chicago 33, Illinois
Phone: Mitchell 6-1212

New York Office
50-B Church Street
New York 7, N. Y.
Phone: BEekman 3-8230

"ANYTHING containing IRON or STEEL"

THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Summer No Excuse . . . The summer doldrums have hit used machinery dealers in Detroit with a bang.

Business is slow but it isn't just because it's summer. True, there are a lot of plants in Detroit that are on vacation or were down during the early part of July.

But dealers generally feel that the vacation period is only part of the cause for their woes. In addition, they blame the steel strike. One prominent dealer in the area reports that at least 2 or 3 deals were held up pending the outcome of the walkout. Manufacturers don't want to commit themselves one way or the other until they see just what kind of a settlement has been reached.

Auto Slowdown Hurts . . . Also, the slowdown in automotive production hasn't helped anybody, particularly the small jobber who depends on the auto industry for the major part of his existence.

As a result, inventories at the present time are quite high. Dealers report a good selection on hand of prime pieces of both production and tool room equipment.

The slackening in business has also been reflected at auction sales in the area. Attendance at the sales is still good and bidding is quite spirited although prices are not as high as they have been, but they are still extremely good.

Auctions Barometer? . . . To some extent, attendance at the auctions belies the lack of activity at the dealer level. It is at least an indication that there is still a market for used machinery despite everything else.

This has led some dealers to speculate that the time is not far off when business will begin to pick up, particularly in the production equipment field. Vendors and small job shops will soon begin producing parts for the 1957 autos.

Thus, dealers figure that their business should start to get better around the middle of August. The improvement is expected to become more pronounced in September and will probably hit its peak by October when every auto producer in the business will be going full blast on 1957 models.

Long Distance Calling . . . In the meantime, calls continue to come in from outside the area but not as heavily as they have in previous months. People are calling Detroit from as far away as New England and Texas. But despite the relatively good inventories on hand, it is sometimes difficult to fill an order for the specific type of machine desired.

There is still a good market for tool room and production equipment, if it is not too old. This is particularly true of vertical and horizontal mills.

Most dealers are confident that the current slump is only temporary. They look for a big upswing this fall. Some are even predicting that, despite the slow third quarter, the year 1956 will be better from all angles than 1955.

"Be a philosopher, Joe. On each machine shop floor some rejects must fall."

CONSIDER GOOD USED EQUIPMENT FIRST

BENDER
#500 Wallace Hydr. Bender; 180°, Cap'y 2¼"
BENDING ROLLS
6' x 3/16" Niagara, Initial Type
6' x ¾" Webb Rsl., Initial Type
10' x 10 Ga. Bertsch, Initial Type
12' x ¾" Cleveland Pyramid Type
16' x ¾" Niles Pyramid Type
27" x 1" Southwark Pyramid Type
BRAKES—LEAF TYPE
10' x 16 Ga. Dreis & Krump Hand Operated
12' x ¾" Dreis & Krump
12' x ½" Dreis & Krump, Motor Driven
BRAKES—PRESS TYPE
10' x ¼" Superior Hydraulic NEW
CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton P&H	29' Span	230 Volt D.C.
5 ton Shepard Niles	45' Span	220/440 A.C.
5 ton Shepard Niles	55' Span	220 Volt D.C.
5 ton P&H	80' Span	220/3/60 A.C.
5 ton Cleveland	90' Span	230 Volt D.C.
10 ton Cyclops	40' Span	220/440 A.C.
10 ton P&H	77' Span	230 Volt D.C.
10 ton P&H	96' Span	220 Volt D.C.
50 ton Hand Oper.	100' Span	
120 ton Whiting	80' Span	220/3/60 A.C.

CUT OFF MACHINES
Yoder AD-2 Cut-off, Max. Capacity ¾" O.D.
Yoder Type L Flying Cut-off, Cap'y ¾" to 3" tubing
FORGING MACHINES
2" Ajax, Air Clutch
1" to 5" Acme, Ajax, National
HAMMERS BOARD DROP—STEAM DROP
STEAM FORGING—600 lb. to 20,000 lb.
2000# Chambersburg Board Drop Model J-2
LATHE—TURRET
#2A Warner & Swasey Univ. Type M 510 Preselector Head. LATE.

LEVELLERS—ROLLER
60" United 17 Rolls 2½" Dia.
72" McKay 17 Rolls 4¼" Dia.
72" McKay 17 Rolls 2½" Dia. Backed-up
84" McKay 17 Rolls 4¼" Dia.
MULTI SLIDE MACHINE
No. 35 U. S. Multi Slide Machine

NO. 3 MEDART THREE ROLL ROTARY STRAIGHTENER
CAPACITY 1" to 4" DIAMETER PIPE OR TUBING

PRESSES—HYDRAULIC
500 ton Clearing H-1500-40, 24" Stroke, Bed 36x42"
600 ton Southwark, 16" Stroke, Bed 60x74"
750 ton Elmes, 54" Stroke, Platen 39¼x38"
800 ton Clearing, 48" Stroke, Bed 48x48"
1000 ton Lake Erie Dble Acting, 46" Strokes, Bed Area & Platen 72" x 146"
PRESS—STRAIGHT SIDE
Clearing Model TF41500-200 Triple Acting Strokes 40, 22, 14". Bed Area 100" x 200"
PUNCH & SHEAR COMBINATIONS
Style EF Cleveland 36" Throat, Punch 1¼" thru 1" Style W Cleveland 60" Throat, 312 Ton
Pels LUSEFF, Punch 1⅜" x 1", Shear Angles 6 x 6 x ⅝", Rd. 2⅛", Sq. 2⅜", etc.
ROLLING MILLS
10" x 16" Single Stand, Two High
12" x 16" Phila. Single Stand, Two High
12" x 29" Standard Single Stand, Two High
15" x 28" Farrel Single Stand, Two High
15" x 30" G & M Single Stand, Two High
16" x 24" Farrel Two Stand, Two High
22" x 12" x 60" Lewis 3-High Sheet Mill
12" Three High Bar Mill
26" x 54" United Single Stand, Two High
8" Torrington Ring Type Reversing Mill
For cold reducing 7" wide strip
ROLLS FORMING
8 Stand Maplewood, Spindle 2" Dia., 12" Dist. between spindles
SHEARS—GATE
80" x ¾" Pels
86" x 1" Hilles & Jones
SHEAR—ANGLE
6 x 6 x ⅝" Cleveland
SHEARS—SQUARING
10' x ¼" Cincinnati, LATE
12' x 3/16" Niagara SL-12
12' x ¾" Steelweld LATE
14' x ⅜" Dreis & Krump
SLITTERS
36" Yoder Slitting Line
G-48 Yoder Gang Slitter, 5" Threaded Arbor
STRAIGHTENERS
Kane & Roach 2 Roll Rotary Straightener, M.D. Capacity Mildsteel ¼" to ⅜"
Kane & Roach 5 Roll #5250-B, Capacity ¾" to 2½" solid, 4¼" Tube
Aetna Standard 12 Roll Straightener, Capacity 2"
SWAGING MACHINE
#6½A Fenn, Capacity 2¼" Tube, 2⅜" Solid 10" Die Length, Hydraulic Feed. LATE
TESTING MACHINES
60,000, 100,000, 200,000 Olsen & Riehle Universal 50,000 and 380,000 lb. Compression
TUBE MILL
Etna Tube Mill, Capacity ⅛" to 2¼" Complete with Welder, Cut-Off and Transformers

Manufacturing

A. T. HENRY & COMPANY, INC.

50 CHURCH ST., NEW YORK CITY 8
Telephone COrtlandt 7-3437

Equipment

Confidential Certified Appraisals
Liquidations—Bona Fide Auction Sales Arranged

Consulting Engineering Service
Surplus Mfg. Equipment Inventories Purchased

MOTOR GENERATOR SETS

Qu.	KW	Make	R.P.M.	D.C. Volts	A.C. Volts
1	2500	Whse.	720	600	4160/2300
1	2000	Al. Ch.	720	250	4160/2300
1	1200	Whse.	720	600	2300
1	1120	Elliott	720	250/250	2300
1	500	G.E.	1200	250	2300/440
1	500	Cr. Wh.	720	575/600	2300/440
1	300	G.E.	1200	250/275	2300
1	200	Elliott	1200	125	4000/2300
2	150	G.E.	1200	250	2300/440
1	120	Whse.	1200	250	2300/440
1	100	Al. Ch.	1200	250	4000/2300

LARGE MILL TYPE MOTORS

Qu.	HP	Make	R.P.M.	Volts	Type
1	3000	Whse.	600	525	Tandem
1	1500	Whse.	600	525	Rev.
1	700	Al. Ch.	135	230	Mill
2	600	Al. Ch.	300/600	600	Mill
2	600	Whse.	110/220	230	Mill
1	450	Whse.	450/600	230	SK
1	300	Whse.	300	230	Mill
4	275	Whse.	425/850	230	QM-660.6
1	150	Whse.	360/720	600	QM-666.3

SLIP RING MOTORS
Constant Duty 3 Phase 60 Cycle

Qu.	HP	R.P.M.	Make	Type	Volts
1	100	430	Al. Ch.		440/220
2	100	495	G.E.	1-15A-M	2300
1	100	900	El. Dy.		2300
1	100	1200	Whse.	CW	440/220
1	104	870	Whse.	CW	440/220
1	125	600	G.E.	1-14-M	2200
1	150	450	Whse.	CW-1000	440
1	150	490	Whse.	CW	440/220
1	150	585	Whse.	CW	4160/2200
1	150	720	Al. Ch.	ARY	440/220
1	200	435	G.E.	I-M	440
1	200	490	G.E.	I-14-M	2200
2	200	585	G.E.	I-12-M	2200
1	250	300	G.E.	MT-414	2200
1	250	720	Al. Ch.	ARY	440
1	350	360	Whse.	CW	2300
1	400	360	G.E.	MT-424	2300/440
1	400	505	Al. Ch.	ARY	2200
1	425	392	G.E.	I-M	440
1	450	440	Whse.	CW	2200
1	450	514	G.E.	I-M	2200
1	500	450	G.E.	I-M	2300
1	500	514	Al. Ch.	ANY	2200
1	700	295	Whse.	CW	2300
1	750	400	G.E.	I-M	2200
1	1000	445	Whse.	CW	2300
1	1250	503	Whse.	CW	6600
1	1500	360	G.E.	MT	2300
1	1800	270	Whse.	Mill type	6600
1	2500	257	G.E.	Mill type	6600

T. B. MAC CABE COMPANY

4302 Clarissa St., Philadelphia 40, Penna.
Cable Address "Macsteel" Philadelphia, Pa.
Phone Davenport 4-8300

4" National Upsetter High Duty, guided overarm slide, air clutch
Ajax & National Upsetters, suspended slide, 2½", 3" 4"; similar upsetters not suspended slide, ¾", 1", 1½", 2", 3"
5" Acme Upsetting & Forging Machines suspended slide, cam side die slide
700-ton Ajax High Speed Forging Press
50,000# Standard Double Draw Bench
#3 Abramson Bar & Tube Straightener
Pels FV-75 Bar & Billet Shear, Cap. 7⅛" rd
10' x ½" Plate Shear, Long & Allstatter 10" throat, M.D. Rebuilt
10' x 1" Long & Allstatter Plate Shear
Hilles & Jones and Buffalo Shears 1½", 2", 2½", 3", 3¼", 4" and 4¼"
1600 & 2750# Chambersburg Model F Board Drop Hammers, Roller bearing; double V-ways, Built 1943
1500# Niles & 2500# Chambersburg Single Leg Steam Forging Hammers
4000# Niles Bemeat Double Frame Steam Forge Hammer
Bradley Hammers, various sizes, including 500# Upright
Nazel Air Forging Hammers, #2-B, 4-B, 5-N
Williams White Bulldozers, #22, #3, #4, #25, #6, #29 U-type
Landis Landmaco and other Landis Threading Machines from ⅜ to 4"
Single and Double End Punches
Multiple Punches
No. 3 Motch & Merryweather Saw, with Saw Grinder

BOLT, NUT AND RIVET MACHINERY, COLD HEADERS, THREAD ROLLERS, THREADING MACHINES, TAPPERS, COLD BOLT TRIMMERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES.

DONAHUE STEEL PRODUCTS CO.

1913 W. 74th Street, Chicago 36, Ill.

RE-NU-BILT
GUARANTEED
ELECTRIC POWER EQUIPMENT

D. C. MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	2200	G.E.	MCF	600	400/570
1	1200	G.E.	MCF	600	650/900
1	1000	G.E.	MCF	600	350/700
1	940	Whse.	QM	250	140/170
1	800	Whse.		250	450/550
1	500	Whse.	CC-216	600	300/900
1	500	G.E.	MCF	230	250/750
2	450	Whse.		550	415
1	250	G.E.	MPC	230	400/600
1	200	G.E.	CD-1650Z	230	500/1500
1	200	Whse.	CB-5113	250	400/800
1	150	G.E.		600	250/750
1	150	Cr. Wh.	65H	230	1150
2	150	Cr. Wh.	83H-TEFC	230	800
1	150	Whse.	SK-151B	230	900/1800
1	150	Whse.	SK-301	230	360/950
1	120	G.E.	MCF	230	350/1000
1	125	Whse.	SK-183	230	850
2	100	Whse.	SK-181	230	450/1000
2	75	C.W.	58H-TEFC	230	340
1	50	G.E.	MD-412AE	230	550
1	50	Whse.	SK-131.5 B.B.D.P.	230	600/2300

M-G Sets—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	D.C. Volts	A.C. Volts
1	2000(3U)	G.E.	514	600	4000/6900/13200
2	2000/2400	G.E.	450	250/300	2300/4000
1	1750/2100	G.E.	514	600	4000/6900/11000
1	2000	G.E.	500 25cy	600	2300/4000
1	2000	G.E.	514	600	6600/13200
1	1500	G.E.	720	600	2300
1	1250	Whse.	720	600	2300/4000
1	750	Whse.	900	250	440
1	500	Whse.	900	125/250	

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
1	3000	A.C.	OISC	3	23000x2300
1	2500	A.C.	Furnace	3	13800x147/113.5
1	2500	A.C.	OISC	3	34520x1380
2	1000	G.E.	HVDDJ	1	2400x4
6	1000	Wagner	OISC	1	13200x4
2	667	G.E.	HD	1	13800x2300
2	500	Kuh	OISC	1	13200x6600
2	333	G.E.	H8	1	7300x2400/4160Y
2	333	G.E.	HD	1	13200x230
2	333	G.E.	HSWR	1	2300/4000x230/4
1	300	G.E.	HT	3	4160x480/27
2	200	Whse.	OISC	1	13200x120/24
1	200	G.E.	HK8	1	4800/2400x230/1

BELYEA COMPANY, INC.

47 Howell Street, Jersey City 6, N. J.

Immediate Delivery
Used Swindell-Dressler
ELECTRIC ARC FURNACE

With Transformers, Switchgear, Controls, Etc. 11'6" Shell Diam. Melting Rate 6 Ton Per Hour

Fabrikant Steel Products, Inc.
233 Broadway • New York, N. Y.

BENNETT MACHINERY CO.

BENDING ROLLS

1—10' x ¾" Bertsch No. 14 Pinch Rolls, 14" diameter, AC, M.D., condition like new, f.o.b. San Francisco, Cal.

375 Allwood Rd., Clifton, New Jersey
Phone Prescott 9-8096 N. Y. Phone LOngacre 3-1220

20" x 30" United 2Hi Cold Mill, Roller Bgs. Suitable for Precision Experimental work.
17 Roll backed up leveller, 3" x 30" Fessler.
5 Roll Heavy Duty Leveller 5¼" x 30".
6" x 30" BRODEN ENGINEERING DOWN COILER.
24" Mattison 464 Strip Gr & Pol. 30 HP AC.

F. H. CRAWFORD & COMPANY, INC.
30 Church Street New York 7, N. Y.

CALL Curry! FOR SURPLUS STEEL PLANT EQUIPMENT

1—35"—3-Hi Blooming Mill, complete with Pinion Stand, Gear Reducer, 2500 H.P. AC Motor, Lift Tables, and Bloom Shear.

1—24" Bar Mill, 2 Stands, One 3-Hi and One 2-Hi, complete with Pinion Stand, Gear Reducer, 2500 H.P. AC Motor, Lift Tables, Transfer Tables, and Shear.

1—12" x 12" Mackintosh-Hemphill Bloom Shear, Down Cut, 48" Knives.

Write for the Curry List of available steel plant equipment

1—2000 H.P. G.E. Slip Ring Motor, 237 RPM, 2300/3/60, Mill Type, complete with Controls and Forced Air Cooling System.

1—2000 H.P. Mesta Gear Reducer, Ratio 10 to 1.

1—34" x 144" Roll Grinder, Farrel-Birmingham, complete with Crowning Attachment.

1—United 26" Vertical Sheet Bar Shear, complete with Tables, Gauge, and Electrics.

1—12' x 3/16" Stamco Power Shear, complete with Holddown.

1—#55 Hendley & Whitmore Combination Punch and Shear.

ALBERT Curry & CO. INC.
STEEL PLANT EQUIPMENT
941 OLIVER BUILDING · PITTSBURGH 22, PENNA.
Phone ATlantic 1-1370

Cable Address: CURMILL-PITTSBURGH

SELECT MACHINE TOOLS

GRINDING MACHINES
72" Hanchett 3-spd. rotary surface, new 1946.
13" x 60" Model 300 Hanchett vert. spdl., late.
14" x 36" Pratt & Whitney hyd. vert. surface, 1942.
No. 72A5 Heald hyd. pl. internal, extended bridge, 1943.
No. 74 Heald hyd. pl. internal, X-sliding H. B., 1941.
12" x 24" Cincinnati ER hyd. universal cyl. serial 2U3B1H-5.
14" x 36 Landis type C hyd. pl. cylindrical, 1942.
6" x 30" Cincinnati EA Filmatic pl. cylindrical, 1942.

HAMMERS
No. 6-1 Nazel, pneumatic late.
No. 5N Nazel, self-contained.
No. 6B Nazel, self-contained.

LATHES
No. 3 Gisholt Univ. Turret Lathes (2), 1942.
14" x 6' Hendey Toolroom, 1940.
15" x 30" Lipe Carbo-Matic, 1942
24" x 20' bed Lodge & Shipley engine lathe, 10 HP Drive.
126" x 96' CC Niles Bement Pond engine lathe, 80 HP M.D.

PLANERS
36" Rockford Hyd. Openside Shaper-Planer.
42" x 42" x 12' Liberty dbl. housing planer, 35 HP M.D.
48" x 48" x 10' Gray Maxi-Service.

PRESSES
90 ton No. 92½C Toledo D.C. Str. Side.
260 ton No. 795½-72 Toledo D.C. Toggle drawing.
500 ton No. 1039 Hamilton D.C. adj. bed, 60" x 102".
2000 ton No. 6 National Maxipress Forging Press.

SHAPERS & SLOTTERS
24" Gould & Eberhardt Universal.
32" G & E Invincible, F.M.D., late type.
36" Rockford openside hyd. shaper-planer, ser. 39H U35.
36" Rockford hyd. vertical slotter, new 1944.

UPSETTERS
3½" Ajax suspended slides, steel frame.
1½" National Upsetter, guided ram, hard ways.
2" National Upsetter, guided ram, air clutch.
4" National high duty, susp. & guided rams.
7½" National Upsetter, air clutch, new 1944.

1000 Tools in Stock

Free Illustrated Catalog

MILES MACHINERY CO.
PHONE SAGINAW 2-3105
7041 E. GENESEE AVE. SAGINAW, MICH.

TRACK SUPPLIES — RAILS

ALSO IN STOCK
STEEL
SHEETS & PLATES
STRUCTURALS
and Aluminum Products

New RAILS Relaying

TRACKWORK of all KINDS

LIGHT RAILS—12# to 60#—20'0" & 30'0"
HEAVY RAILS—60# TO 100#—30'0" & 33'0"
JOINT BARS, BOLTS, TIE PLATES, SPIKES & TOOLS, FROGS, SWITCHES, STANDARD & SPECIAL TRACKWORK.

SEND US YOUR INQUIRIES

KASLE STEEL CORPORATION
BOX 536 ROOSEVELT PARK ANNEX, DETROIT 32, MICH.—PHONE TIFFANY 6-4300

5" Bar #45 Giddings & Lewis Horizontal Table Type Boring Mill Serial #8046.

3" Bar Tri-Way Universal Boring Mill Serial T2430.

2-3-4 Spindle Leland Gifford Drills.

#300 Hanchett Vertical Surface Grinder Ser. #300-17 capacity 13" x 72".

#2D Kearney & Trecker Rotary Head Tool and Die Milling Machine Serial #18-5212. New 1945.

48" x 48" x 12' Cleveland Heavy Duty Openside Planer.

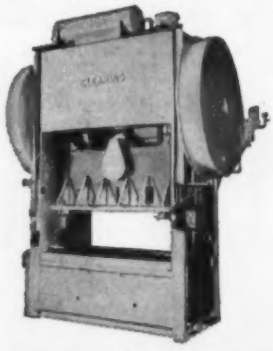
3V Van Norman Vertical Miller—Late.

30" x 120" Hanchett Horizontal Spindle Plano Surface Grinder Late Type Serial OS-13.

Hazard Brownell Machine Tools, Inc.
350 Waterman St. Providence 6, R. I.
Dexter 1-8800

WORLD'S LARGEST STOCK
STAMPING PRESSES

BLISS • CLEARING • CLEVELAND
FERRACUTE • HAMILTON • L & J
NIAGARA • TOLEDO • V & O



SQUARING SHEARS • PRESS BRAKES
REBUILT *and* GUARANTEED

JOSEPH HYMAN & SONS
TIOGA, LIVINGSTON & ALMOND STS.
PHILADELPHIA 34, PA. *Phone* GArfield 3-8700

ROLL GRINDER

36" x 240" CINCINNATI
Traveling Wheel Head
Filmatic Bearing—Hydraulic Feed
Crowning Attachment—Motors—Controls

IN STOCK

LANG MACHINERY COMPANY, INC.
28th St. & A.V.R.R. Pittsburgh 22, Pa.
GRant 1-3594

Overhead Cranes & Hoists
New and Used
135-ton Alliance Ladle Crane, 4-girder, 24-ton auxiliary trolley, 50'0" span, 230 volts D.C.
15-ton Shaw Gantry Crane with magnet take-up reel, 35'0" span, 30-ft. lift, 220 vo. 3 ph. 60 cy.
100 Other cranes various spans, tonnages and current.
JAMES P. ARMEL, Crane Specialist
710 House Bldg. Pittsburgh 22, Pa.
Tele.: Gr. 1-4449

No. 410-D Chicago Brake, NEW.
Fellows No. 4B Gear Burnisher.
Natco Nos. G5 & C12 Multi-Drills.
Fellows Str. Line Gear Generators.

D. E. DONY MACHINERY CO.
4357 St. Paul Blvd. Rochester 17, N. Y.

No. 1 & No. 2 BUFFALO FORGE Vertical Angle Bending Roll, Motor and Controls.

FALK MACHINERY COMPANY
16 Ward St. Baker 5887 Rochester 5, N. Y.

COMPRESSOR DIRECTORY
World's Best Rebuilts

95 CFM	1500 psi	6½-3⅞ x1⅝ x 7	Chicago TCB3
138 CFM	100 psi	7 x 7	Ingersoll ESI
234 CFM	100 psi	9 x 9 x 9	Chicago St. (new)
268 CFM	500 psi	10-4½ x 10	Ingersoll XOB
343 CFM	500 psi	11-5 x 13	Worthington (new frame)
464 CFM	100 psi	12 x 11	Gardner RX
478 CFM	100 psi	11½ x 7 x 7	Worthington YB2
552 CFM	100 psi	13—8 x 12	Ingersoll XRB
593 CFM	100 psi	13½—8 x 8	Ingersoll XRE2
676 CFM	100 psi	15—9¼ x 12	Ingersoll XRB
640 CFM	100 psi	16—10 x 10	Pennsylvania DE2
877 CFM	100 psi	17—10½ x 14	Ingersoll XRB
1685 CFM	42 psi	16—16 x 10	Ingersoll XRE1
1723 CFM	110 psi	140 lbs. st	Ingersoll XPV (excellent)

Portables—Worthington 60 to 600 CFM

AMERICAN AIR COMPRESSOR CORP.
DELL & 48TH STREET
NORTH BERGEN, N. J.
Telephone UNion 5-4848

PRESSES

#247 HAMILTON, S.S.S.C., Tie Rod, Back Geared, 125-ton, 7" stroke, G.M.D.

#650 BLISS, S.S.S.C., Hi-Speed, Tie Rod, Flywheel, 2" stroke, roll feed, scrap cutter, automatic oiling, M.D.

#30C-24 CLEVELAND, Double Crank, Gap Frame, Flywheel, 5" stroke, automatic oiling, M.D.

POWER PRESS SPECIALISTS
471 North 5th St. Phila. 23, Pa.

LOCOMOTIVES

We own and offer subject to prior sale:
2—80 ton WHITCOMB diesel electric, 650 HP, new 1944
2—45 ton PORTER diesel electric, 300 HP, new 1942
Full data and prices on request. May be inspected in operation

Pan American Engineering Company
P. O. Box 1709, Tel. LOgan 8656
Dallas, Texas

AVAILABLE FOR
IMMEDIATE DELIVERY

1—35-40 ton Model 8 Industrial Brownhoist Diesel Locomotive Crane, Serial #11401, with 50' boom, powered with Caterpillar D13000 diesel engine. Cap. 70,000# @ 12' radius; 84,000# @ 12' radius with outriggers. Thoroughly rebuilt. Will pass the most rigid inspection. Your inspection invited. Located at our Clifton Heights, Pa., plant.

Write for New Stock List No. 456

EQUIPMENT CORPORATION OF AMERICA
CLIFTON HEIGHTS, PA., P. O. Box 608E
PITTSBURGH 30, PA., P. O. Box 933E
CHICAGO 4, ILL., 327E So. La Salle St.
NEW YORK 7, N. Y., 30E Church St.

LIKE NEW

RECIRCULATING PIT DRAW FURNACE
Lindberg Type 4348E-16 Temp. 1600°F. 3 sets of 43 Dia. x 48 Deep Work Baskets. Power Demand—110KW—Complete with Controls.

JOE MARTIN CO., INC.
19256 John R. Street Detroit 3, Michigan
Phone Twinbrook 2-9400

eastern Rebuilt Machine Tools

THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

GEAR TESTERS
12" National Broach & Machine Co.
18" National Broach & Machine Co.
18" Gleason Bevel Gear Tester, m.d.
No. 471 Michigan Tool Co. Hob, Reamer & Gear Checker

AUTOMOTIVE GRINDERS
No. 76 Van Norman Automatic Piston Turning & Grinding Machine, m.d.
Kwik-Way Model H Piston Turning & Grinding Machine, m.d.

CENTERLESS GRINDERS
No. 2 Cincinnati, m.d.
No. 2 Cincinnati, m.d., Filmatic Spindle, 1943.
Cincinnati Valve Seat Grinder, cap. ⅜" Valve seat, m.d.

CARBIDE GRINDERS
14" Hammond Double End Carbide Tool Grinder
#44 Excello Double End
#48 Excello Carboloy 2 wheel Grinder, m.d.
#49 Excello H. D. Carbide, m.d.

CRANKSHAFT GRINDERS
18"x66" Landis Universal Type C, m.d., late
22"x72" Landis Type CH, m.d., late

CYLINDER GRINDERS
No. 73 Heald Airplane Cylinder Grinder, m.d., new
Model FG Micro Cylinder Grinder, m.d.
No. 50 Heald, m.d., 1944

KEYSEATERS
No. 854 Micromatic Vertical Honing Machine, m.d.

HONING MACHINES
No. 182 Barnesdrill Hone, m.d.
No. 854 Micromatic Vertical Honing Machine, m.d.
H1 Micromatic Horizontal Hydrohoner, m.d.
H4 Micromatic Horizontal Hydrohoner, m.d.
No. 6 Barnes Twin Spindle
No. 306H Barnes Single Spindle
No. 224B Barnes Honing Machine, m.d.

THREAD GRINDERS
No. 33 Excello, m.d.

We carry an average stock of 2,000 machines in our 11 acre plant at Cincinnati. Visitors welcome at all times.

THE EASTERN MACHINERY COMPANY
1002 Tennessee Avenue, Cincinnati 29, Ohio
MElrose 1241 CABLE ADDRESS—EMCO

CRANES
BOUGHT & SOLD
ENGINEERED TO
YOUR REQUIREMENTS

Ornitz Equipment Corp.
Industrial Engineering Service
220 3rd Ave. Brooklyn 17, N. Y.
TRiangle 5-2553

PRACTICALLY NEW PRESSES

Minster No. 50-7-72, cap. 200 tons, Bed 72"x50".
Bliss-Toledo No. 93½H, cap. 140 tons, Bed 84" x48".
Bliss-Toledo No. 93½J, cap. 140 tons, Bed 108" x48".
Bliss No. 5-40 Double Action Toggle Draw Press, Strokes 20" and 31", will draw and lift out 15", Bed 40" x 40".

ALL MACHINES HAVE AIR CLUTCH AND SOME HAVE AIR CUSHIONS AND MOTOR DRIVEN RAM ADJUSTMENTS. STILL SET UP IN PLANT.

"If it's machinery we have it."

NATIONAL MACHINERY EXCHANGE
128 Mott St. New York 13, N. Y.
CAnal 6-2470

GOOD QUALITY TOOLS

24"x276" LANDIS Type "B" Hydraulic Plain Cylindrical Grinder.
2H, 2K & 3H K & T Plain & Vertical Millers.
16"x16"x48" THOMPSON Type "C" Hydraulic Surface Grinder.
Nos. 1B x 74" and 1½B x 81" PRATT & WHITNEY Deep Hole Drills.

WIGGLESWORTH INDUSTRIAL CORPORATION
62 Border St. E. Boston, Mass.

TURBO-GENERATORS
for stand-by use

(3) units available—300 KW—120/240 volts DC—1250 amps.—Allis Chalmers—driven by Allis Chalmers geared turbine—190 lbs. 475° T.T. This is a marine turbo-generator that operates condensing. "Like-New" condition.
(4) units available—300 KW turbo-generators—120/240 volts DC—1250 amps—turbine 440 lbs.—740° T.T.—25"-28" Hg—mfg. by Joshua Handy Westinghouse. Marine type, in "Like-New" condition.

THE BOSTON METALS CO.
313 E. BALTIMORE STREET
BALTIMORE 2, MD.—LE. 9-1900

MACHINES FOR YOUR YARD
Northwest 1 yd. crawler crane
30" belt conveyor 200' long
40' bucket elevator
Quickway truck crane with 29" magnet
Harris Power Horse with bucket
Simplicity 2x6 screen

TRACTOR & EQUIPMENT CO.
10006 Southwest Highway, Oak Lawn, Ill.

DIESEL ELEC. LOCOMOTIVES
25 TON GEN. ELECTRIC LIKE NEW
1—35 TON & 2—45 TON PORTERS Al.

USED STEEL SHEET PILING
377 PCS CARNEGIE M116—40' & 58'

R. C. STANHOPE, INC.
60 E. 42nd St. N. Y. 17, N. Y.

OFFERING
BRIDGE CRANES

ARNOLD HUGHES COMPANY
765 Penobscot Bldg. Detroit, Mich.
WOodward 1-1894

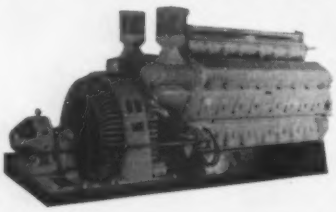
LIFTING MAGNETS

A complete magnet service. Magnets, new & rebuilt, generators, controllers, reels, etc.

Magnet specialists since 1910

Goodman Electric Machinery Co.
1060 Broad St. Newark 2, N. J.

OUTSTANDING VALUE!



(1) ONLY 1250 KVA 4600/2300 VOLT 3 PHASE 60 CYCLE 720 RPM WESTINGHOUSE SYNC. A.C. GENERATOR—80% PF—S.O. 6P455 WITH DIRECT CONNECTED 10 KW EXCITER—ENGINE MODEL 16-567 ELECTRO-MOTIVE DIV. G.M.

Inspection In Detroit

Just purchased from General Motors, Detroit, Diesel Engine Division, where it was used as stand-by generator only! No expense was spared to keep it in "like-new" condition. At specific periods, without regard to wear, parts such as pistons, liners, rings, etc., were replaced. And the unit has been insured to the strict standards of the Hartford Insurance Co. Generator was used on afternoon shift only and was never run around-the-clock. Spare parts include (1) factory reconditioned blower; (1) extra blower; and a quantity of new pistons, liners, heads, bearings, etc. Unit complete with Westinghouse oil circuit breaker—15000 volts—type F-124—600 amps.—60 cycle—solenoid operated—mounted in drawer-type cubicle 20" wide—44¼" deep—88" high. Motor operated rheostats.

PRICED TO SELL IMMEDIATELY

Also Located Same Plant

(1) 12-567 1000 HP diesel engine made by GM Electro-Motive Div.—driving 850 KW 550 volt DC generator at 720 RPM. If you need DC, here it is! Same outstanding condition as 1250 KVA unit detailed above.

THE BOSTON METALS CO.
313 E. BALTIMORE STREET
Baltimore 2, MD—LE 9-1900

LIQUIDATION SALE OF FABRICATING EQUIPMENT PRICES SUBJECT TO NEGOTIATIOIN

Ransome Welding Positioner, Size #13. Serial #4964. 6,000 lbs. Cap.
4—Ransome Welding Positioners. Model 2SP. Capacity 2,500 lbs.
Ransome Heavy Duty Welding Positioner, Serial #5603. 16,000 lb. Capacity. 7½ HP Motor & 5 HP Motor.
Aronson Welding Positioner, Style 14-C500. 500 lbs. Capacity. Hand Balanced and Positioned.
LeBlond Lathe. 20 HP, 220V/60/3 Motor. Serial #ND6707966. 36" swing. 28' bed. 2¼" hole thru spindle. 21" between centers. 1 to 30 threads per inch Geared Head Geared Chuck.
Lodge & Shipley Engine Lathe. 24" swing. 5' centers. Motorized. Taper attachment. Quick change. Thread cutting.
American Radial Drill. 8" Column. 3' Arm. Speeds 500 to 2000 RPM. Feeds .003, .006, .010. 3 HP 3/60/220V Motor.
Fosdick Radial Drill Press. 10" Column. 3' Arm. Power feed on drill and arm. 3 HP G. E. Motor. Angle bed plate.
Southwark Double End Punch & Shear with 10 HP Motor. 48" Throat.
New Doty C Frame Punch & Shear. 60" Throat.

MARTIN J. SUSSMAN CO.
442-444 Lehigh Street
Allentown, Penna.
PHONE HEMLOCK 5-7181
WIRE — WRITE — PHONE

For Sale—Modern

5" SELLERS FLOOR TYPE HORIZONTAL BORING, DRILLING and MILLING MACHINE

Equipped with 60" x 60" Power Rotary table

Available for Immediate Delivery

East Coast Industrial Service
121 Ellison Street Paterson 1, N. J.
MUlberry 4-6031

3074 ft. AIR COMPRESSOR
C-P, type OCE, new 1944
cyls. 30&18x21, 125 lbs.
500 HP Motor, 3-60-2200.
M-G Exciter Set.
PB Panel, A-C-L.
Air Rec. Aftercooler
Condition: A-1.

V. D. DEMAREST
188 Euclid Ave.
Hackensack, N. J.

ROTARY CONVERTERS

2 — 1500 — KW — GE. Synchronous (Steel Frame) Type HCC., Form P, Serials 5220722 & 24, Volts DC. 600, 3/60/440/720 RPM. With: 2 Sets of 3-525 KVA—GE. Transformers, Type ABJ, Form F, 1 Ph., 60 Cy., 13,800/445 Volt, air pres. 1 oz. Complete on original foundation. Priced low, before removal.

JARRAP CORPORATION
2416 Richmond St., Philadelphia 25, Pa.
Ga. 6-8227—6-2680

CRANES — TRUSSES

1—Bedford EOT 20 Ton Mill Crane, 50 ft. span, 220 V AC
1—Shepard Niles EOT Crane, 5 ton, 30 ft. span, 230 V DC
1—American Lo-Head Mono Rail Hoist, 4 ton, 230 V DC
32—Mill Type Roof Trusses, 50 ft. span, Hip & Flat
1—Mill Type Crane Runway, 50 ft. span, 90 ft. long, 26 ft. under hook
1—2 Ton Tram Rail Crane

HETZ, P. O. BOX 671, WARREN, O.
PH. NILES, OHIO, OL 2-6688

FOR SALE
IMMEDIATE SHIPMENT

35—100,000# capacity all steel twin hopper cars—New 1941
30—80,000# capacity all steel 40'0" box cars with double doors.
4—100,000# capacity all steel gondola cars.
3—140,000# capacity all steel gondola cars.
5—Class III 3-compartment non-coiled tank cars.
5—Class III 3-compartment coiled tank cars.

We buy and sell railway cars, locomotives, locomotive cranes. Turn your surplus equipment into cash.

PHONE — WIRE — WRITE

HYMAN-MICHAELS CO.
108 No. State St. Chicago 2, Ill.
Dearborn 2-5422

FOR SALE

2 Used Units, in excellent condition, Model 2-C.W. Metco Wet Collectors, Manufactured by Schmieg Industries, Inc. Complete with built-in 2000 C.F.M. blower, 3HP-220/3/60 Motor, and push-button starting switch. Detailed drawing available on request.

Reply to:
Price Brothers Company,
1932 East Monument Avenue,
Dayton 1, Ohio
Purchasing Department.

COMPLETE CUPOLA UNIT
NEW—1955

48" Whiting #5 Cupola with 3 ton Crane charging bucket, Wilbraham Green rotary pressure blower, size #7, with Westinghouse gear drive motor 125 HP, grids and control panel—2 standard Whiting transfer cars 48" & 60", electric towing car and Fairbanks 3000# track type charging scale.

Eastern Scrap & Salvage Corporation
65 Muirhead Avenue, Trenton, N. J.
Phone—OWen 5-6351

STEEL PIPE AVAILABLE
U.S.A. Specifications

ISRAEL CORPORATION OF AMERICA
18 East 41st Street, New York 17, New York

Locomotive Cranes, Used—For Sale
1—30T Industrial Brownhoist Diesel—1942
1—30T Browning Diesel—1943
1—25T Industrial Steam, Erection 85' boom
Overhead Crane, Used—For Sale
1—20T, 39' Span, P&H—440 AC
GEORGE M. MERIWETHER
Industrial Equipment
1712 7th Avenue North—Birmingham 4, Ala.

TUBE MILL

COMPLETE YODER M-2½ WITH 200 KVA RESISTANCE TYPE ROTATING TRANSFORMER WELDER, SIZING, STRAIGHTENING, ROTARY CUT-OFF, GENERATORS, CONTROLS AND ALL ELECTRICAL. CAPACITY ⅝" TO 3" DIAMETER. NEW IN 1950.

AMCO MACHINERY COMPANY
125 LEIB ST. DETROIT 7, MICH.
LORAIN 7-1070

Railroad Freight Cars—Gondola, Box and Flat Cars. Tank Car Tanks—8000 gallon. Steam Locomotive Crane. Rails.

Consolidated Ry. Equipment Co.
6702 So. Cicero Ave., Chicago 38, Ill.

RAILS
FOR IMMEDIATE DELIVERY
NEW AND RELAYING QUALITY
TIE PLATES
FROGS • SWITCHES
LIGHT RAILS
TRACK ACCESSORIES
MORRISON
RAILWAY SUPPLY CORP.
814 Rand Bldg. Buffalo 1, N. Y.
MOhawk 5820

SELF-PROPELLED DIESEL
LOCOMOTIVE CRANE
Full Revolving Steel Cab

(1) Browning locomotive crane—Model 3HN1—built 1942—serial #3165. ENGINE: Cat. D-13000—with Twin-Disc clutch. Boom 75'—main and aux. hook. Capacity 35 tons or 45 tons with outriggers. Engine hours —3300. Hydraulic controls—air compressor—Westinghouse air brakes—steel disc on travel friction. NEVER USED COMMERCIALLY. Just purchased from Navy. This crane has had little or no use and represents a unit in practically new condition.

THE BOSTON METALS CO.
313 E. BALTIMORE ST.
BALTO. 2, MD.—LE 9-1900

FOR SALE
FREIGHT CAR REPAIR PARTS
RELAYING RAILS & ACCESSORIES
STEEL STORAGE TANKS
FRT. CARS & LOCOMOTIVES
CONTRACTOR EQUIPT. & MACHINERY
THE PURDY CO.
8754 S. DOBSON AVE.
CHICAGO 19, ILL. — BA 1-2100
ALSO ST. LOUIS, MO.—SAN FRAN., AND LONG BEACH, CALIF.

FOR SALE

25 ton Ohio Diesel Locomotive Crane. New 1947. Caterpillar D-13000 Engine. Excellent Condition.
35 ton Ind. Brownhoist Diesel Locomotive Crane. New 1943. Caterpillar D-13000 Engine. 15 KW Magnet Generator. Excellent
50 ton Whitcomb Diesel Electric Locomotive 300 HP Cummins Engines. New 1943. Reconditioned.
65 ton Atlas Diesel Electric Locomotive 400 HP Cummins Engines. New 1942. Reconditioned.
115 ton Alco Diesel Electric Locomotives 1000 HP. New 1941.

Mississippi Valley Equipment Co.
501 Locust St. St. Louis 1, Mo.

Keep 'em rolling . . . not rusting
FOR SALE
New—Used—Reconditioned railroad freight cars • car parts • locomotives • tank cars • steel storage tanks.

MARSHALL RAILWAY EQUIPMENT Corporation
50 Church St., New York 7, N. Y. COrtlandt 7-8090
Cable MARAILQUIP

FOR SALE
STEEL BUILDING
50'0" x 200' 0" with 15 ton AC floor operated crane, mfd 1943, 25'3" under eaves, 20'0" c to c columns. Immediate delivery.

ORNITZ EQUIPMENT CORPORATION
220-3rd Ave. Brooklyn, N. Y.

New **RAILS** *Relaying*
We carry frogs, switches, spikes and bolts in stock and most all sections of rails and track accessories.
M. K. FRANK
480 Lexington Ave., New York, N. Y.
Park Building, Pittsburgh, Pa.
105 Lake St., Reno, Nevada

CONTRACT MANUFACTURING

Special Washers
We carry in stock Silicon killed steel specially suited for case-hardening. Stock dies for producing washers from .0015 to ½" thick.
Thomas Smith Company
294 Grove St., Worcester, Mass.

MEEHANITE
and NI-HARD CASTINGS
PATTERNS
MACHINE and PLATE SHOP WORK
CUSTOM-BUILT MACHINERY
HARDINGE MANUFACTURING CO.
240 ARCH ST., YORK, PA

Let us quote on STAMPINGS and ASSEMBLIES from drawing or sample
Drilling . . . Blanking . . . Riveting . . . Forming . . . Tapping . . . Welding . . . Toolmaking of course
COMPLETE DESIGN AND DEVELOPMENT FACILITIES
HUEBEL MFG. CO., INC.
763 Lexington Ave. Kenilworth, N. J.

Gray Iron and Semi Steel Castings, also alloyed with nickel, chrome, and molybdenum. Wood and Aluminum pattern work.
KING FOUNDRIES, INC.
Phone 823 North Wales, Montg. Co., Pa.
22 Miles from Philadelphia, Pennsylvania

SPECIAL MACHINERY
DIAMITE *Abrasive Resistant* Castings
NI-RESIST *Heat & Corrosion Resistant* Castings
P M G BRONZE *High Strength Acid Resistant* Castings
Fully Equipped—Pattern Foundry & Machine Shop Facilities—Castings to 15 tons.
Weatherly Foundry & Mfg. Co., Weatherly, Pa.

PIPE CUT TO SKETCH
We cut and thread all sizes of steel pipe to sketch. Our up-to-date machinery has a capacity of ⅛" to 12" pipe diameter. We specialize in production runs of cut pipe in large quantities in uniform length. Please call on us for quotations.
AUSTIN MFG. CORP.
61 Austin Street Worcester, Mass.

DROP FORGINGS
Special Forgings of Every Description.
We solicit your prints or model for quotation.
Wilcox Forging Corporation
Mechanicsburg Penna.

DROP FORGINGS
To Your Specifications
Prompt Quotations
BALDT ANCHOR CHAIN & FORGE DIVISION
P. O. Box 350—Chester, Pennsylvania

---

10 to 12 foot lengths
Any diameter up to 1¼ inch
All thread forms
All metals

H&G threaded rods
For studs, hangers, worms, translating screws, etc.
21 Barclay St.
Eastern Machine Screw Corp., New Haven, Conn.

PRESS FORGINGS
MERRILL BROS.
5626 ARNOLD AVENUE
MASPETH, QUEENSBORO, N. Y.

OLSON
SCREW MACHINE PRODUCTS

Made to your specifications and tolerances. From smallest up to 2⅝" diameter in steel, brass and aluminum.

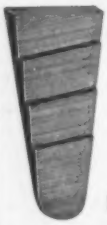
OLSON MANUFACTURING CO.
101 Prescott St., Worcester, Mass.

GEM INSULATING FIREBRICK

★

THE GEM CLAY FORMING CO.
SEBRING, OHIO

STA-FAST STEEL WEDGES



sharp edges give holding power like a screw.
Self-Aligning Steel Belt Fasteners
Standard Steel Rivets used with Self-Aligning Fasteners
STAMPINGS PUNCHINGS WASHERS
to your specifications
Catalog sent upon request
SALING MANUFACTURING COMPANY
Standard-Belt-Fastener Division
UNIONVILLE, CONNECTICUT

Contract Machine Work

Parts and Complete Machines, Heat Treating and Grinding. Mail Blue Prints for Quotations.
GENERAL MACHINE WORKS
York, Pa.

DROP FORGE DIES

Forging Engineers—Die sinkers—Manufacturers of drop forge dies and hot work tools for presses and upsetters.
COMMERCIAL DIE COMPANY
7851 Intervale Ave., Detroit 4, Mich.
Phone: WEBSTER 3-7104 Cable Code "Comdie"

Nepsco
NEW ENGLAND PRESSED STEEL COMPANY
Contract Manufacturer since 1914
METAL STAMPINGS
SPECIALTIES — APPLIANCES
For Industrial and Domestic Users
P.O. BOX 29
NATICK MASSACHUSETTS

THE FORMULA:

Multi-operation presses
plus
Yankee skilled workmen
over
Eighty years manufacturing
know-how equals
Low cost metal stampings
And precision assemblies
To meet your needs
The GREIST MANUFACTURING CO.
646 Blake St., New Haven 15, Conn.

STANDARDIZE WITH
STANDARD

MADE TO YOUR SPECIFICATION
STEEL TUBING
CARBON · ALLOY AND STAINLESS
SEAMLESS OR WELDED
PRESSURE AND MECHANICAL
MILL OR WAREHOUSE QUANTITIES
STANDARD TUBE SALES CORP.
76-01 WOODHAVEN BLVD. · BROOKLYN 27, N. Y.

TOOL AND DIE WORK

Full facilities for the manufacture of small machine parts. Send blue prints for quotations. Prompt Service.
DON'S MACHINE SHOP
1004 Capitol Street Harrisburg, Pa.

WELDED or RIVETED
STEEL PLATE
FABRICATION

- ★ Gas Seal Hoods for Blast Furnaces
- ★ Furnace Roof Rings
- ★ Cinder Cooling Cars
- ★ Billet Cars
- ★ Ingot Cars
- ★ Ladle Cars
- ★ Hopper Cars
- ★ Gondola Cars
- ★ Heavy Truck Bodies
- ★ Boiler Casings
- ★ Boiler Breechings
- ★ Flues and Ducts
- ★ Condenser Shells
- ★ Condenser Piping
- ★ Heavy Turbine Housings
- ★ Hoppers and Bunkers
- ★ Tanks and Vats
- ★ Pressure Vessels
- ★ Wind Tunnels
- ★ Crane Bridge Girders
- ★ Trolley Frames and Trucks
- ★ Rigid Frames
- ★ Roll-Over Fixtures
- ★ Engine Frames and Bases
- ★ Crawler Frames
- ★ Press Platens and Beds
- ★ Press Columns
- ★ Heavy Machinery Parts and Assemblies
- ★ Design Conversion of Castings to Weldments

MACHINING
★ Complete Machining Service—Facilities for Heavy Work of Unusual Dimensions

THE R. C. MAHON COMPANY
DETROIT 34, MICHIGAN
Branch Offices in New York and Chicago
MAHON

WANTED TO BUY

HYDRAULIC PRESS BRAKE

200 TO 400 TON CAPACITY

SEND DETAILS AND SPECIFICATIONS

ADDRESS BOX G-377

Care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39

WANTED
SURPLUS STEEL
WALLACK BROTHERS
7400 S. Damen Ave. Chicago 36, Illinois

WEISS STEEL CO. INC.
600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS
Buyers of Surplus Steel Inventories
37 Years of Steel Service

WANTED
BRIDGE CRANES
ARNOLD HUGHES COMPANY
765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

Have you any of these Gear Reducers for sale?

HP	RPM INPUT	RATIOS
1000	441	1.28:1 to 6.30:1
600	348	1.11:1 to 4.43:1
500	900	2.63:1 to 6.00:1
400	257	1.20:1 to 1.72:1

STRUCTURAL METALS, INC.
Box 911 Seguin, Texas

HELP WANTED

PLANT CONSTRUCTION

Openings for:—

JUNIOR & SENIOR ENGINEERS

With Steel Plant or Construction experience to inspect construction of integrated steel plant in South America. Contracts & Profit Sharing.

Submit resume, expected salary.
All replies held in confidence.

ADDRESS BOX G-375
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

MANAGER. Used Foundry Equipment Division of prominent machinery company. To direct sales and advertising. Top salary with unlimited opportunity for advancement. Give complete resume in first letter. Replies confidential. Location Eastern Pennsylvania. Address Box C-368, care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

ENGINEER WANTED. "ENGINEERS, DESIGNERS AND CHECKERS WHO ARE QUALIFIED PERSONNEL WITH EXPERIENCE IN DESIGNING AND BUILDING HEAVY MACHINERY, OFFICES LOCATED IN MID-WEST. EXCELLENT OPPORTUNITIES DUE TO BACKLOG OF ORDERS." ADDRESS BOX C-378, CARE *THE IRON AGE*, CHESTNUT & 56th STS., PHILADELPHIA 39.

SITUATION WANTED

CHIEF ENGINEER—B.S. Mechanical with 25 years in design and construction of chemical and metallurgical process machinery including Rolling Mills, Presses, Pressure Vessels, Special Machinery, Hydraulic Components, and Systems. Address Box G-381, care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

EMPLOYMENT EXCHANGE

LUBRICATION ENGINEER

Southern California concern operating a large variety of heavy machinery and mobile equipment has technical staff position open for qualified man with mechanical or chemical engineering degree, or equivalent. Must be able to prescribe correct lubricants and lubricating methods, write specifications and schedules, oversee lubricating costs and standards in wide range of usage. State experience, age, training, etc.

ADDRESS BOX 371
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

METALLURGICAL RESEARCH ENGINEERS

A wide variety of immediate and future openings exist for capable engineers with backgrounds or interests in any of the following areas of metallurgical endeavor:

—Physical and Process Metallurgy
—Titanium and Light-Alloy Development
—High-Temperature Metallurgy
—Metals Joining

These openings offer outstanding possibilities for professional recognition, and out-of-the ordinary promotional opportunities in a stable, progressive organization which has enjoyed a threefold expansion in the last ten years. For technical application form and literature describing our operations, write to

Technical Personnel Manager
BATTELLE INSTITUTE
505 King Avenue Columbus 1, Ohio

OPPORTUNITIES
MECHANICAL AND ELECTRICAL ENGINEERS

Should have a degree and experience in heavy machinery operation. Electrical Engineers should be familiar with AC and DC circuits and operation of latest type controls. Mechanical and Electrical Draftsmen of heavy equipment also needed. These jobs are available now in a large rolling mill in the Chicago area. A fast growing, progressive company paying the highest wages in the area. Good working conditions. Modern plant. More than the usual fringe benefits in effect.

ADDRESS BOX G-379, Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

METALWORKING BRIEFS

Continued from P. 47

3. Premium pay for Sunday work: time and one-tenth in first year, time and one-fifth in second year, time and one-fourth in third year.

4. A 52-week supplementary unemployment plan providing benefits equal to 65 pct of take-home pay.

5. Improved union shop clause guaranteeing that all steel workers eventually will be members of the union.

6. Improved insurance program paid for by additional contribution of 3¢ an hour shared equally by company and employees.

7. Minimum pension increased to $2.40 per month for each year of service prior to Nov. 1, 1957, and $2.50 per month for each year thereafter. Workers retired under 1949 and 1954 programs also benefit.

8. An additional paid holiday; pay for holidays worked increased to double time and a tenth July 1, 1957, to double time and a quarter July 1, 1958. Improved vacations. Shift differentials increased from 6¢ to 8¢ on afternoon shift, 9¢ to 12¢ on night shift. Jury pay.

Contract and SUB will terminate June 30, 1959; insurance and pensions Oct. 31, 1959.

Fox In Line for Coal Job

Edward G. Fox, top negotiator for the anthracite industry, appears headed for the late Harry M. Moses' job as president of the Bituminous Coal Operators Assn. The job was offered to Mr. Fox, who is former president of Reading Anthracite Co. He will face an immediate test with John L. Lewis' coalworkers ready with new demands.

Olin Mathieson Goes Nuclear

Formation of a Nuclear fuel division to produce nuclear fuel elements and nuclear reactor cores is announced by Olin Mathieson Chemical Corp. Equipment is now being installed in space that has been reconstructed at the Winchester arms plant in New Haven, Conn., for August operation.

Air Force Places Extrusion Order

An $861,400 contract has been awarded the Lombard Corp., Youngstown, O., for complementary extrusion tools for the 12,000-ton horizontal press being constructed at Torrence, Calif.

Orders for Titanium Development

National Research Corp. has been awarded an Air Force contract for development of manufacturing methods and pilot plant production of titanium alloy castings. A portion of the project will be devoted to study of frame and engine manufacturers' needs.

ADVERTISERS

An asterisk beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturer for your copies today.

A

Acorn Iron & Supply Co. 108
Allis-Chalmers Mfg. Co. 40
Amco Machinery Co. 140
American Air Compressor Corp... 139
American Screw Co. 31
American Steel Foundries, King Machine Tool Div.....Back Cover
Armco Steel Corp. 6
Armel, James P. 138
*Armstrong Bros. Tool Co. 110
Atlantic Steel Products Co. 135
Austin Mfg. Corp. 141

B

Babcock & Wilcox Co., The Refractories Div. 35
Baldt Anchor, Chain & Forge Div.. 141
Basic Incorporated Inside Front Cover
Battelle Institute 143
Belyea Co., Inc. 137
Bennett Machinery Co. 137
Bertsch & Company 135
Bethlehem Steel Co. 1, 146
Blaw-Knox Company Foundry & Mill Machinery Division .....14 & 15
Boston Metals Co. 139-140-141
Boynton, A. J., & Co. 135
Brad Foote Gear Works, Inc. ... 74
Brownell, Hazard, Machine Tools, Inc. 138

C

*Carborundum Co., Refractories Div. 37
Cattie, Joseph P. & Bros. 135
*Cincinnati Bickford Division, Giddings & Lewis Machine Tool Company 12
*Cincinnati Milling Machine Co., The, Process Machinery Division 79
*Cincinnati Shaper Co., The 59
*Climax Molybdenum Co. 39
Colorado Fuel & Iron Corp., The Wickwire Spencer Steel Div..80 & 81
Commercial Die Co. 142
*Cone Automatic Machine Co., Inc. 36
Consolidated Railway Equipment Co. 141
Continental Foundry & Machine Division Blaw-Knox Company 14 & 15
Copper & Brass Research Association 46
Copperweld Steel Co., The 104
Crawford, F. H. & Co., Inc. 137
Cross Company, The 10
Crucible Steel Casting Co. 102
*Crucible Steel Co. of America.. 25
Curry, Albert & Co., Inc. 138

D

Davis Keyseater Co. 135
Dempster Brothers, Inc. .....20 & 21
Denison Engineering Co., The 53
Donahue Steel Products Co., Inc... 137
Don's Machine Shop 142
Dony, D. E. Machinery Co. 138
Dreis & Krump Mfg. Co. 13
Duraloy Co., The 112

E

Eastern Machine Screw Corp., The 135-141
Eastern Machinery Co., The 139
East Coast Industrial Service .. 140
Eastern Scrap & Salvage Corp... 140
Equipment Corp. of America ... 139
Erie Foundry Co. 24
Espen-Lucas Machine Works, The. 113
*Exide Industrial Division, The Electric Storage Battery Company 38

F

Fabrikant Steel Products, Inc. ... 137
Falk Machinery Co. 138
Federal Machine & Welder Co... 26
*Fostoria Pressed Steel Corporation 30
Frank, M. K. 141

G

Gem Clay Forming Co., The 142
General Chemical Div. Allied Chemical & Dye Corp. 77
General Machine Works 142
Goodman Electric Machinery Co. 139
Goss & DeLeeuw Machine Co. ... 135
Great Lakes Steel Corp. 61
*Greenlee Bros. & Co. 29
Greist Manufacturing Co., The .. 142
Griffin Manufacturing Co. 135
Gripholst, Inc. 145

H

Hardinge Mfg. Co. 141
*Haynes Stellite Company, a Div. of Union Carbide & Carbon Corp. 125
Henry, A. T. & Company, Inc. ... 137
Hetz Construction Co. 140
*Hobart Brothers Company 8
Houghton, E. F., & Co. 4
Huebel Mfg. Co., Inc. 141
Hughes, Arnold Co. 139-143
Hyman, Joseph & Sons 138
Hyman-Michaels Co. 140

I

*Industrial Brownhoist Corp. 56
Industrial Products Suppliers 135

IN THIS ISSUE

Industrial Trading Co., The 140
Iron & Steel Products, Inc. 136
Israel Corp. of America 140

J

Jarrap Corp. 140
Johnson Bronze Co. Between Pages 24 & 25
Jones & Laughlin Steel Corp. 75

K

Kasle Steel Corp. 138
*Kearney & Trecker Corp. 68
*Keystone Steel & Wire Co. 78
King Foundries, Inc. 141

L

Lang Machinery Co. 138
Lavallee & Ide, Inc. 9
*Linde Air Products Co., a Div. of Union Carbide & Carbon Corp.. 17
*Logan Co. 111
Luria Bros. & Co., Inc. 121

M

MacCabe, T. B., Co. 137
Mahon, R. C. Co., The 142
Marshall Railway Equip. Corp. .. 141
Martin, Joe Co., Inc. 139
Master Electric Co., The Inside Back Cover
Meriwether, Geo. M. 140
Merrill Bros. 141
Metallurgical Products Department General Electric Company..18 & 19
Miles Machinery Co. 138
Miller Electric Mfg. Co., Inc..... 102
Mississippi Valley Equipment Co.. 141
Morgan Engineering Co., The 27
Morrison Railway Supply Co. 141
Mundt, Chas. & Sons 145

N

National Acme Co., The 103
National Forge & Ordnance Co... 32
National Machinery Co. 139
National-Standard Company 107
National Steel Corp. 61
New England Pressed Steel Co.... 142
*New Jersey Zinc Company, The.. 62
Newport Steel Corp. 99

O

*Ohio Electric Mfg. Co., The ... 123
Ohio Steel Foundry Co. 72
Olson Manufacturing Co. 142
Ornitz Equipment Corp. 139-141
Osborn Mfg. Co., The 5
*Owen Bucket Co., The 102

P

Pan-American Engineering Co. ... 139
Pickands Mather & Co. 16
Poole Foundry & Machine Co. .. 135
Portage Machine Co., The 82
Price Bros. Co. 140
Purdy Company, The 141

R

*Ransburg Electro-Coating Corp. 101
*Reliance Electric & Engineering Co. 70
*Republic Steel Corp. .....22 & 23
*Robbins & Myers, Inc., Crane & Hoist Div. 76
Roebling's John A. Sons Corp. Between Pages 24 & 25
Ryerson, Jos. T. & Son, Inc. 116

S

Saling Manufacturing Company.. 142
*Shepard Niles Crane & Hoist Corp. 109
Smith, Thomas Co. 141
Stamco, Inc. 135
Standard Oil Co. of Indiana ... 33
Standard Tube Company 142
Stanhope, R. C., Inc. 139
Structural Metals, Inc. 143
Sussman, Martin J. Co. 140

T

Texas Company, The 64
Timken Roller Bearing Co., The.. 42
*Tinnerman Products, Inc. 55
Tractor & Equipment Co. 139
Tube Methods, Inc. 11

U

Ulbrich Stainless Steels 28
Union Carbide & Carbon Corp., Haynes Stellite Co. 125
Union Carbide & Carbon Corp., Linde Air Products Co. 17

W

Wallack Bros. 143
Weatherly Foundry & Mfg. Co. .. 141
Weiss Steel Co., Inc. 143
Wheland Co., The 108
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp. 80 & 81
Wigglesworth Industrial Corp. ... 139
Wilcox Forging Corp. 141
*Wisconsin Motor Corp. 100

Y

Youngstown Sheet & Tube Co., The 34

CLASSIFIED SECTION

Clearing House 136-141
Contract Manufacturing 141-142
Employment Exchange 143
Equipment & Materials Wanted .. 143

MUNDT

PERFORATED METALS

The few perforations illustrated are indicative of the wide variety of our line—we can *perforate almost any size perforation in any kind of metal or material* required. Send us your specifications.

Sixty-seven years of manufacturing perforated metals for every conceivable purpose assure satisfaction.

Write for New Catalog of Patterns

TIN, STEEL, COPPER, ALUMINUM, BRONZE BRASS, ZINC, ANY METAL, ANY PURPOSE

CHARLES MUNDT & SONS

50 FAIRMOUNT AVE. JERSEY CITY, N. J.

XVI

This is the sixteenth of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.

Copper: Its Principal Effects in Alloy Steels

One of the best known of all metals, copper certainly needs no introduction here. Its uses are legion. It is one of the best conductors of heat and electricity. It is popular with the housewife, essential to the engineer. But possibly not so well known is its very important function as an alloying element in certain types of steels. So used, copper increases resistance to atmospheric corrosion and also acts as a strengthening agent.

Since copper does not oxidize in the steel melt, it can be added at any time during the course of the heat. Pure copper melts at about 1980 deg F.

Copper is added to steel in varying amounts. The actual proportion, of course, depends upon the end product in mind. Some of the most widely used copper-bearing steels are those containing from 0.20 to 0.50 pct. In these, copper has been found to increase corrosion-resistance without materially affecting mechanical properties. It has been found, too, that paint frequently lasts longer on such steels than on the non-copper-bearing types.

Among the best known of the copper-bearing steels are the high-strength, low-alloy grades developed in recent years. Generally speaking, the ductility of steels in this group is comparable to that of conventional structural steel. The yield strength, however, is usually higher. Copper, working as a team with chromium, nickel, and phosphorus, substantially raises the level of corrosion-resistance in these steels; yet its presence does not adversely affect welding characteristics.

Copper-bearing steels are a subject in themselves, a subject in which Bethlehem metallurgists are well versed. If you would care to know more about this interesting group of steels, feel free to consult with our technicians. They will gladly work closely with you and help with any problems you may encounter. And please remember, too, when you need alloy steels of any kind, that Bethlehem manufactures the full range of AISI standard alloy grades, as well as special-analysis steels and all carbon grades.

If you would like reprints of this entire series of advertisements, Nos. I through XVI, please write to us, addressing your request to Publications Dept., Bethlehem Steel Company, Bethlehem, Pa. The material is now available in a convenient 32-page booklet, and we shall be very glad to send you a free copy.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

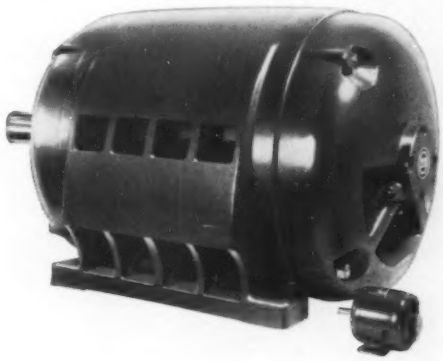
BETHLEHEM STEEL

You Name It—Thousands of Ratings

From 1/8 to 400 H. P.

See MASTER for a selection of motor drives that you can get nowhere else—for specialized power drives unequalled for flexibility, compactness and performance. See Master for the right horsepower, right shaft speed, right mounting features—to add salability to your products, efficiency to your plant equipment.

Master components are designed to combine in one compact unit to suit your needs exactly—all the way up to 400 H. P. Just ask us for information.



Motor Ratings	1/8 to 400 H.P. All phases, voltages, and frequencies.
Motor Types	Squirrel cage, slip ring, synchronous, repulsion-start induction, capacitor, direct current.
Construction	Open, enclosed, splash-proof, fan-cooled, explosion-proof, special purpose.
Speeds	Single-speed, multi-speed, and variable speed.
Installation	Horizontal or vertical, with or without flanges and other features.
Power Drive Features	Electric brakes (2 types)—5 types of gear reduction up to 432 to 1 ratio. Mechanical and electronic variable speed units—fluid drives—every type of mounting.

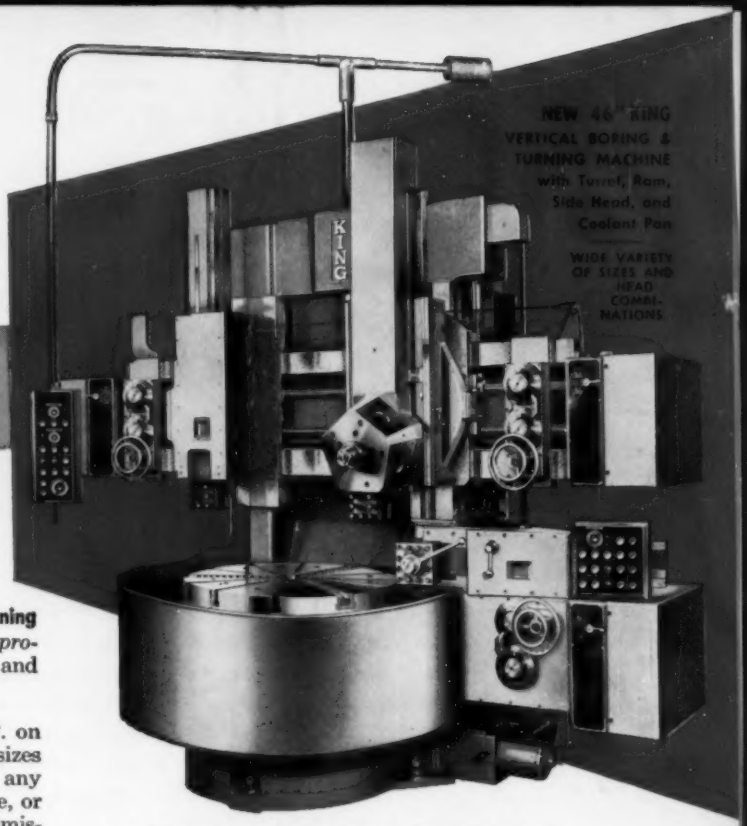
THE MASTER ELECTRIC COMPANY
Dayton 1, Ohio

MASTER ELECTRIC MOTORS

POWERED FOR PRODUCTIVITY

...the all new

KING


NEW 46" KING
VERTICAL BORING & TURNING MACHINE
with Turret, Ram, Side Head, and Coolant Pan
WIDE VARIETY OF SIZES AND HEAD COMBINATIONS
KING

greater horsepower — expanded speed and feed ranges — permit use of modern cutting tools to their fullest capabilities

Completely re-designed King® Vertical Boring & Turning Machines bring to boring mill users the *greatest productive capacity ever achieved* for vertical boring and turning work.

Horsepower has been increased to 40 to 50 H. P. on 30″ to 46″ machine sizes; 75 to 100 H. P. on sizes 56″ and up. Spindle drive provides 24 speeds in any one of three standard ranges: high, intermediate, or low. As illustrated below, complete drive transmission is mounted in an extra-rugged housing, providing greatly increased stability. The entire drive can be removed from the machine as a unit.

24 feeds from .0016″ to .250″ per revolution are provided. The exact feed can be selected to produce the desired surface finish on any material at the required production rate.

Complete electrical controls are provided, located on pendant station and on fixed panel mounted on side head, for maximum ease and speed of manipulation.

With many other features, the *all new* King provides industry with a high-efficiency machine tool capable of taking full advantage of new cutting tools, new materials, new methods. For full details, send for new Catalog K-5. Write direct or to the King distributor in your area.

Additional Features of the ALL NEW KING

- **NEW SPINDLE AND SPINDLE MOUNTING, PROVIDING MAXIMUM TABLE STABILITY.**
- **AUTOMATIC LUBRICATION OF ALL MOVING PARTS.**
- **ANTI-BACKLASH NUTS FOR ALL CROSS-FEED MOVEMENTS.**
- **MACHINE ADAPTED FOR SIMPLE OPTIONAL ADDITION OF:**

Automatic positioning of heads.
Automatic tracing control of heads.
Automatic cycling.
Power rail clamping.
Power indexing of turrets.

American Steel Foundries
KING MACHINE TOOL DIVISION
1150 Tennessee Avenue • Cincinnati 29, Ohio

COMPLETE ELECTRICAL CONTROLS

All electrical controls are conveniently located on the pendant station and on a fixed panel mounted on the side head, as follows:

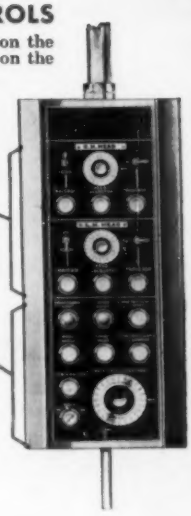
LOCATED ON PENDANT—

Feed and rapid traverse movements — and — Pre-selective feed selection from direct-reading dials: for rail heads on machines with two heads on rail . . . for rail head and side head on machines with one head on rail.

Power swiveling of rail heads

Pre-selective speed selection from direct-reading dial

Speed change • Turret index • Table step



LOCATED ON SIDE HEAD PANEL—

Feed and rapid traverse movements of side head — and — Pre-selective side head feed selection from direct-reading dial: on machines with two heads on rail.

Main drive • Rail positioning • Coolant pump

Thread cutting and taper turning selection for all heads

Spindle Drive Transmission

Re-designed throughout. EXTRA-RUGGED HOUSING provides increased stability and rigidity for mounting of the shafts.

•

Short shafts used throughout with points of support as close as practical to bearing centers.

KING VERTICAL BORING & TURNING MACHINES